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LECTURES

ON THE

THEORY AND PRACTICE OF MIDWIFERY,

DELIVERED AT GUY'S HOSPITAL BY

DR. BLUNDELL.

Standard Pelvis.

THE standard pelvis, Gentlemen, as I observed to you yesterday, is divided by accoucheurs into two regions, the one lying below, the other above, the brim; the former being denominated the *false* pelvis, the latter the *true*. As the true pelvis, or that part of it which is lying below the brim, is of very great importance in the practice of midwifery, with a view to a necessary examination of it, it has been obstetrically distinguished into three parts, the *brim*, the *outlet*, and the *intermediate cavity*. The superior aperture of the pelvis, into which the child descends, is denominated the brim; the inferior aperture, at which the child comes forth into the world, is called the outlet; and the space between the two has received the name of cavity of the pelvis. If you examine a large collection of pelves, you will probably soon discover that there are no two brims that are formed exactly alike; there are some which are larger and some which are smaller; some which are more round, some which are more oval; but in general you will find that the brim tends to an oval form; the long measure of which is lying from side to side, and the short measure, or diameter, from before backward, the regularity of the oval being broken behind by the projection already mentioned (of great importance,) I mean the promontory of the sacrum. The measure of these diameters, the larger and shorter, is found in different pelves to vary. An average may be four inches for the short diameter, five inches for the long diameter, reaching from side to side, and five and one-eighth or five and one-fourth for the oblique diameter, which is stretching in a well-formed pelvis from the back of the acetabulum to the *sacro-iliac synchondrosis*. These few points are the principal niceties in the anatomy of the brim. They are all very easily borne in mind, and all of more or less importance in your practice. The brim varies in its make; being in some round, in others more oval; in some small, in others large; but in general when the pelvis is standard, it is of an elliptical form, the regularity of the oval being broken by the promontory of the sacrum. Of this oval the long measure is from side to side, the short from before backward; the average width between the sacrum and the pubis about four inches; the average dimension from side to side about five inches; the oblique, or that which is stretching between the acetabula and the *sacro-iliac synchondroses*, about five and one-eighth, or five and one-fourth.

When a labour begins in an ordinary way, the vertex of the child presenting, that is, lying over the centre of the pelvis, we find, in the commencement of the process, that the face is lying to one side of the pelvis and the *occiput* to the other side, and thus, the long length of the head and the long length of the oval brim of the pelvis corresponding mutually, the head very readily descends. Sometimes, indeed, it happens, that the head of the child is placed in a labour with the face not laterally but in front, and then the long length of the head is opposed to the short length of the superior aperture, or brim, and consequently if the pelvis be small and the fœtus large, it cannot be transmitted. I have myself, unfortunately, been compelled to open the head of a child because it lay in this way; and even where there is a large pelvis and a small head, it passes with difficulty in this position.

It sometimes happens that children are coming away feet first, under what may be called the crural presentation, nor is this delivery on the whole uncommon. Now when a child descends in this manner, if the softer parts are very relaxed, the pelvis very capacious, nor the child not very large, it

descends easily enough; and whether you are acquainted with the make of the pelvis or not, probably you will find little difficulty in accomplishing the delivery. But it sometimes also happens, that a pelvis is very small, or a child is very large, and then a great deal of care may be necessary to get the fœtus away, more especially where you are abstracting the head. Now I have said the long measure of the brim is from side to side, and the short measure from before backward; therefore, the face ought to lie on the side of the pelvis, that the long and short measure of the head and brim may correspond. If I do not attend to this, in dragging the head downwards with the face over the pubis in the manner I now show you, I may go on pulling until I separate the head from the body, and then I have an unfortunate case,—and this is midwifery with some people, a sort of obstetric dray horses. They pull straight forward and without considering, come what may, and marvel when accidents occur. Now in this case the whole difficulty arises not from misfortune, but mismanagement, either from my not knowing what is the form of the brim of the pelvis, or, what is the same thing, knowing it and not acting on my knowledge; for I tell you again what I told you yesterday, that it is necessary, not only to be acquainted with the principles of midwifery, but to carry this knowledge to the bed side of the patient, and to make it operate there in your practice, for there is a living and dead knowledge in the healing art, as there is a living and dead faith in religion. Now, then, instead of pulling violently in this case, if I only turn the face of the child to the one side of the pelvis, so as to make the long length of the head to correspond with the long length of the pelvis, the head, as you here see, passes with the greatest facility; it is therefore by adroitness and dexterity, and not by main strength, the difficulty is to be overcome—*arte, non vi*. But to proceed:—It sometimes is necessary to carry your hand up into the pelvis, an operation never to be done if it can by possibility be avoided. Remember that carrying your hand into the *uterus* you may bruise, you may tear, you may kill; but still occasionally you are compelled, by inexorable necessity, reluctantly to do that which is always dangerous, particularly if you have a large hand and boisterous disposition.—More especially you may have to perform this operation for the purpose of turning the child, by drawing the feet down over the brim of the pelvis. Now even in performing this simple operation, you may avail yourselves of the knowledge of those anatomical properties of the brim which we have just been contemplating, for if you wish to enter easily into the cavity of the uterus, when near the brim of the pelvis, you ought to lay your hand in the side of the aperture, because there we find most room. These points may seem to be of little importance, but what I stated to you yesterday may be here repeated; it is an operative knowledge of those little circumstances which makes all the difference between a dexterous and an embarrassed operator, in other words, between one who is fit to practise the manual part of midwifery and one who is not. So much then respecting the brim of the pelvis, of oval form, the long length from side to side, the short length from before backward, the regularity of the oval broken by the promontory of the sacrum, points of anatomy of great importance in the practice of our art.

Inferior Aperture.—When I take the bony pelvis, and make my observation on its outlet or inferior aperture, which I purpose next to consider, I find that this aperture is of a very irregular form, consisting of three large scallops, one upon either side, and one in front of vast obstetric interest, known under the name of the *arch of the pubis*; but if I take a pelvis, with which the ligaments are still in connexion, I then find that this aperture of nameless irregularity, assumes a more familiar shape, tending somewhat towards a quadrangular figure, as you here see. Now this is the form of the aperture in the living woman, with the bones of which the sacro *sciatic* ligaments and various softer parts are connected. When I examine again this quadrangular or square aperture, I find, that like the brim of the pelvis, it has its two measures, the one from side to side, which may average about four inches, though varying, and the other stretching from the arch of the pubis to the front of the os coccygis, which may, though it likewise varies, average about four inches also. It seems, therefore, in this stage of our observations, that there are two striking differences between the inferior and superior apertures of the pelvis; the superior being oval, the inferior more square; the two measures of the inferior being of equal length (four inches,) whilst the measures of the superior are unequal. But I must now remark, that the os coccygis before described, is made up of two or three pieces of bone, the pieces being connected to each other by cartilage, so that it acquires a certain degree of flexibility; and, moreover, that this bone, is put into connexion with the sacrum, by the sacro coccygeal joint, which allows a retreat of one inch. In consequence of the retreat of the coccygis and the flexibility of the bones, we find that the outlet behind admits, under pressure, of being elongated about an inch; so that when the coccygis is thrown out, as in difficult labours it will be,

there are, in fact, two diameters, the one lying about five inches from before backward, the other about four inches, and stretching between the sides. Here, however, be it observed, there is this important obstetric difference between the brim and outlet, at the brim the long measure is from side to side, and the short from before backward, whereas at the outlet, the long measure is from before backward, and the short from side to side; accordingly we find in ordinary labour, when entering the superior aperture, the child's head comes into the pelvis, with the face to the one side, and the occiput to the other, but that at the outlet before it emerges, its position changing, the face gets into the *hollow* of the sacrum, and the occiput under the arch of the pubis, the *sagittal* suture resting on the *perinæum*, a part not yet described. In this way the long length of the head corresponds with the long length of the outlet, and so the child passes more easily into the world.

If you are bringing the child's head from the pelvis under a foot presentation, this nicety of anatomy, which I have been mentioning, must not be forgotten. Should you pull down the child, the face lying to the one side of the pelvis and the occiput to the other, if the head be small, and the pelvis large, the fœtus will come away notwithstanding; but if the pelvis is small and the head large, the face and the occiput lying in the way I have supposed, you may go on pulling till you separate the body from the head. Dr. Lowther, once requested to attend in a case of great difficulty, as it was represented, found on making his examination that the head was nearly severed from the body; a piece of information which a midwife, his predecessor, seemed loth to communicate, imagining, perhaps, that he would complete the operation she had begun, and take the whole credit of it to himself. (Laughter.) On further investigation, he observed also, that the head was lying at the outlet of the pelvis, with the face towards the one side, and the occiput towards the other, the long measure of the head lying against the short measure of outlet. Directed, therefore, by those oracular whispers, the whispers of common sense, he cautiously put the face of the child into the hollow of the sacrum, and without further difficulty, to the great surprise of the parties, the head was abstracted. Thus it may happen in a foot case, if you have a large head and a small pelvis, and forget to put the head into the proper situation, you may do the woman a great injury, and actually pull the head of the child from the body, while, by knowing and acting on this small point of anatomy, the whole difficulty may be surmounted, or rather set aside.

But to proceed: we are obliged sometimes to carry the hand into the pelvis for other purposes, or in order to turn the child. Now an operative knowledge of the flexibility of the coccyx, may be of advantage even in performing this simple operation. If the hand in entering the pelvis bear too much anteriorly, or to the one or other side, it cannot be easily introduced; but bearing it backward on the perineum and the yielding coccyx, care being taken not to lacerate or strain the parts, we may often introduce it with comparative facility. A hint, which must not be forgotten in your practice. And thus much respecting the outlet of the pelvis, so far as it is interesting to the accoucheur. Though somewhat quadrangular in its form, it has, like the brim, a long and short diameter; but there is this important difference between the two, at the brim the long axis lies from side to side, at the outlet from before backward, so that the two measures are placed at right angles with each other.

Cavity of the Pelvis.—In the cavity of the pelvis, one of the first points of obstetric anatomy deserving our attention, is the *incurvation* of the *sacrum*, and consequent formation of that *hollow of the sacrum* so often mentioned by the accoucheur. In some women the sacrum is straighter, and there the hollow becomes smaller; in others it is much more incurvated, and there you will find the hollow greater, as may be conspicuously seen in the specimens I now exhibit. This hollow is, in the practice of midwifery, interesting, for it makes more room for the child's head, or breach, or whatever part may be descending. When the vertex presents, the face lies there; when the face, the occiput lies there; nay, even in breech presentations, you will find that the delivery is facilitated by the lodgment of a part of the buttock in the cavity of the sacrum.—Of this knowledge, we may avail ourselves in practice, when you are assisting in a foot case; for example, when the head is in the cavity, you might throw the face forward and the occiput backward, thereby occasioning difficulty; for the parts, as you may see, do not fit well together; the rule, therefore, is to place the face and forehead backward, and the occiput in front. Suppose a child is coming away vertex first, and that you are obliged, though unwillingly, to have recourse to the forceps; on abstracting by this instrument, you might throw the occiput forward, and the face backward; but as the face does not fit well under this position, availing yourselves of the benefit of your anatomical knowledge, you may throw the face backward, and the occiput forward, when the head will readily come forth. When we examine the cavity of the pelvis further, we

find it is of a very *unequal depth*; and this is also a little point of anatomy, not of much consequence certainly, but yet not to be forgotten. In front it is shallow, not above an inch and a half in depth; behind it is deeper, about four times as deep as in front; laterally, the depth is intermediate; so that if you examine the pelvis all round, you find its depth various; shallow in front, deeper behind, intermediate laterally; and therefore it is, in an ordinary labour, that when a child's head has got down into the pelvis, although behind and laterally it be still incarcerated among the bones, so that much difficulty may be experienced in completing its expulsion; yet, in front, it lies bare and open to the finger. And this I mention, because those who are commencing the practice of midwifery, sometimes imagine, upon feeling the head in the front of the pelvis, that the fœtus is just upon the point of emerging, whereas it may be embarrassed by the bones enclosing it laterally and posteriorly, and parturition may be protracted for hours. The shallowness of the pelvis in front is not to be forgotten, when you are making examinations; if you wish to examine well, and I hope every gentleman instructed in this school will examine dexterously, for I look upon this operation as of the first importance to an accomplished accoucheur. If you wish to examine well, you must learn to carry your fingers very far into the pelvis, and this cannot be done if you lay them on the sides or back where the pelvis is deeper, it is only in front of the pelvis where the bones are shallower, that the tips of the fingers can be insinuated considerably beyond the brim. Here again I may observe to you, that it is an attention to these minute circumstances, which makes the difference between a clumsy and a dexterous operator; in other words, between one who is qualified to undertake the manual part of midwifery, and one who is not.

Arch of the Pubis.—There is yet a third point of obstetric anatomy here which I must notice, and that is the large scallop in front, frequently mentioned by the accoucheur under the name of the arch of the pubis. This arch is obviously important; because, in ordinary labour, when the head is at the outlet of the pelvis, this arch facilitates the passage, by allowing the occiput to lie forth in front as I here demonstrate, and thus making more room within. Or, again, suppose the child presents by the face; that is, that the face comes away as the first part; as the labour advances, the chin gets out under the arch of the pubis; and the vertex, lying in the hollow of the sacrum, there is room afforded here in front to facilitate the delivery. It is, at the point of the arch of the pubis, that you will always find the *orifice* of the *urethra*, when you want to introduce the *catheter*. The readiest mode of doing this, is to place the woman on her left side, and putting your finger on the point of the arch of the pubis, you will easily ascertain the orifice; but of this hereafter. The standard arch is of large span, wider in some women, more contracted in others; where contracted, some little difficulty may arise, as the chin or occiput cannot lie forth as far as ordinary. Here is a specimen of a very contracted arch, and here is another specimen of a very capacious one. Observe the effect producing by either on the passage of the head.

Incurvation of the Pelvis.—There is one other property of the cavity of the pelvis, which I must notice, I have reserved for the last, although I look upon it as the most important of all—that is, the incurvation of it; for, instead of the tube or tunnel which it forms being straight, it is curved in the same manner as if (being formed of some yielding material, such as tempered wax, for instance) its front were placed on my bent knee, and the upper and under parts of it were drawn towards my body, in the way I now demonstrate. In consequence of the pelvis being thus incurvated, a straight line will not pass through the *axis*, or, in other words, through the *centre* of this cavity; it must be a curved line of course, as the pelvis itself is curved, a point which I will endeavour to illustrate: here is a pelvis, from which I remove the lateral half, with a view of showing you the cavity and its incurvation, and here you will see that, upon placing a straight line (this wire) in the axis of the upper half, the straight line will not keep the axis throughout the cavity below; it is in the centre above, but it is not so below. And conversely you may observe, that if it be placed on the axis of the lower half of the pelvis, it gets completely away from the centre of the cavity above—therefore, in order to keep the axis throughout the cavity, the line must be incurvated, the convexity lying towards the sacrum, and the concavity towards the pubis. And observe, the curve of the axis corresponds pretty exactly with the curve of the sacrum; the two, as this demonstration shows, being nearly, if not wholly, parallel with each other. Now, on this account, and this is the great practical observation to be made upon it, as the cavity of the pelvis is curved in the manner demonstrated, the course of its axis or central line at the brim lies downward and backward, so that a straight line will pass downward through the axis of the upper portion of the pelvis to the point of the sacrum or the parts lying near it; and further, in consequence of this curve, as the course of the central line at the outlet is downward and forward as before

demonstrated, a straight line placed in the axis of the inferior half of the pelvis, will, at its upper extremity, bear upon the promontory of the sacrum. How very important, and very easy, it is to recollect this, namely, that the axis of the brim passes downward and backward, and that the axis of the outlet passes downward and forward. In ordinary labours, the head follows the axis of the brim in the commencement when traversing the brim, passing downward and backward as here demonstrated, and, in the same way, passing downward and forward when it emerges through the outlet. If you have a foot case, and there chance to be a large head and a small pelvis, you will find the knowledge of the axis to be of no small importance. If, in abstracting the head, I were to draw downward and forward through the brim, instead of bearing downwards and backwards towards the point of the sacrum, pulling the head against the symphysis pubis as you here see, I might draw till I drew the child's head from its body, without getting it away. To bring the head through the brim, I must draw a line leading from the centre of the superior aperture to the point of the sacrum, when, as you may here observe, it will be transmitted with comparative facility. I have myself known a child's head torn from its trunk, from the practitioner not being aware of this. The same thing is not to be forgotten when the head is at the outlet, though attention to these niceties is of minor importance, as the difficulties are smaller. When you get the head to the outlet, you ought to draw downward and forward, (the axis of the outlet lying in this direction,) when the head will pass readily enough; by neglecting this, you may create a difficulty which it is easy to avoid. Even in bringing the fœtal body through the pelvis, the course of the axis must not be forgotten, and this more especially if the pelvis be contracted, and the body form a larger mass than ordinary.

Well, then, for I will not weary you with further illustrations, remember that the cavity of the pelvis is not straight, but incurvated; that the curve corresponds with the bending of the sacrum; that the incurvation is such, that at the brim the course of the axis is downward and backward toward the lower extremity of the sacrum; that at the outlet its course is downward and forward, so that a straight line passed upwards would impinge against the promontory of the sacrum, and that by a sort of semicircular movement it is, that the head and other parts are transmitted.

Distorted Pelvis.—It is happily not often that we are meeting with *distortions* and *contractions* of the pelvis in the *higher degrees*, yet now and then those cases do occur, and when they occur give rise to most formidable difficulties and dangers, the notice of which is well deserving our closest attention. When a pelvis thus becomes distorted in consequence of *fracture*, *rickets*, or above all, which is the most frequent cause, from the *mollities ossium*, or softening of the bones, we find in general that all parts of it are more or less altered in shape; the false and the true pelvis, the brim, the cavity, the outlet—are all incurvated and distorted together, as in the specimens exhibited; yet it does sometimes happen, where there is a good deal of distortion and contraction of the pelvis, that these are confined principally to certain parts of the pelvis only, a fact of some little importance to us in practice. Here, for example, is a pelvis which, if compared with a standard, seems much distorted at the brim, yet if you examine it at the outlet you will find that it deviates there but little from the natural form and capacity. Where there are distortions of the pelvis too you will not unfrequently find, upon examining specimens in this museum, that one side of the pelvis is much more contracted and distorted than the other.

Now, should you meet with cases of distorted pelvis, (and in practising in large towns, such as Liverpool, Manchester, Leeds, Glasgow, and this Metropolis, cases of this kind will occasionally occur,) you must carefully examine with your fingers what part of the pelvis is the most contracted, and what part the most roomy, in order that you may direct your operations accordingly. These distortions of the pelvis occurring, of course there is no end to the different varieties of forms that the bones may assume; nevertheless I have observed, on making an examination of my specimens, that there are *two* leading shapes, or forms, to which these varieties may be reduced, and which may not inaptly be denominated the *angular* and the *elliptoidal*.

At the brim we sometimes meet with elliptical distortions (I here show you specimens,) produced by the approximation of the promontory of the sacrum towards the symphysis pubis, the length of the brim becoming increased somewhat between the sides, and between the front and back abbreviated. At the outlet also (as this pelvis proves) the ellipsoid contraction may occur, the symphysis pubis being approximated to the lower extremity of the sacrum and the coccyx, so as to obstruct or to render impracticable the passage of the fœtus, even after its bulk has been reduced by the perforator.

The second variety of distortion, or the angular, is produced at the brim in consequence of the acetabula and the promontory of the sacrum being all of them pushed in-

ward upon the axis of the pelvis. Of this kind of distortion I here exhibit a very striking example, and I once possessed a cast, which some rude hand demolished, in which the acetabula and promontory were so nearly approximated, that the brim was, as it were, divided into three fissures, two laterally and one in front. At the outlet also the angular distortion occurs, and here it is occasioned by the approach of the tuberosities of the ischia and the incurvation of advance of the sacrum and coccyx, as this distorted pelvis shows, and gives rise, as at the brim, to a formidable contraction of the passage.

Well, what is to be done with women unhappily labouring under these distortions and contractions, whether of the elliptical or angular kind? What assistance can you afford them in their deplorable situation? If such a female is unfortunately pregnant, and in the end of her gestation, there are but two modes in which the delivery can be accomplished; the one is by *laying open* the child and reducing its bulk, the other is by performing the *Cæsarian operation*, in other words, by making an opening through the abdominal covering and uterus, by introducing the hand at the apertures and extracting the child by the operation of turning, as it is called. If the fœtus is to be abstracted in these cases by the natural passage, the head must be perforated, the contents must be removed, nay, sometimes the thorax and abdomen itself must be laid open, and when in this manner the bulk of the fœtus is reduced, and the parts are softened by putrefaction, it may at length be got away. Under circumstances of this kind then, it becomes a question whether you should perform the Cæsarean operation or the operation of *embryotomy*. Dr. Hall, of Manchester, and Mr. Burns, who has written so well on midwifery, have ascertained, that when the standard head is reduced, in the best possible way, to the smallest size, by the most expert operator, it will require, for its transmission, an aperture of three inches in its length, and in its breadth one inch and three-quarters; therefore if you find, upon examining, that no part of the pelvis is so capacious as this, it follows that the Cæsarian operation must be performed, and perforation is unjustifiable. After all, however, the mere capacity of the aperture will not enable us to decide, for not to mention the difficulty of ascertaining it with precision, much must depend on the skill of the operator, and one man may fail altogether in his attempt to deliver, when another may bring away the child with comparative facility. On the whole, perhaps, the rule may with advantage be laid down as follows:—If the passage of the pelvis be three inches throughout in length, and one inch and three-quarters throughout in breadth, and if the operator possess the necessary skill, then let him bring away the child by the operation of embryotomy; if, on the contrary, the capacity of the passages be not equal to that I have stated, and if the operator be wanting in dexterity, and unable to call in some person who may be more expert than himself, the Cæsarian operation must be performed.

A robust country woman, in vigorous health, the mother of several children, was thrown out of a cart, which went over her, and broke her pelvis to pieces. She was carried home and lay a long time, but at last recovered. She again became with child, and was attended by a woman, but the pelvis was so contracted by the displacement of the fractured bones, and the mass of osseous matter by which they were consolidated, that the midwife was unable to deliver her. Mr. Barlow, of Blackburn, who used to relate the case, was called in, and found that she could not be delivered without the performance of the Cæsarean operation. As soon as she was willing to submit to it, feeling there was no hope in any other way, he performed it, and the child was extracted, but it was dead, (probably before the operation its vitality was become extinct,) but the mother herself did very well; in a fortnight after the incisions were made she got up, and in three weeks she was attending to her usual concerns. Now I mention this case as a rare instance of the success of the Cæsarian operation, for in general that operation, as performed at present, proves fatal. I mention it also as an instance of the operation being required, in consequence of the fracture of the pelvis, and a high contraction of it produced by this cause.

But I put another case, which ought to be duly weighed before you engage in practice, as the life of some unfortunate woman may depend on your previous consideration of it. I will suppose a woman has a high contraction, and is in the early months of gestation; I will suppose she may not have gone above one or two months: now in this case, of course it would, if practicable, be desirable to introduce an instrument into the uterine cavity, so as to *discharge* the *liquor amnii*, and in that way bring on a *premature delivery*; but very probably you might not be able to enter the uterus, nay, you might not be dexterous or fortunate enough even to feel the os uteri; now under these circumstances another operation, and an operation which I would strongly recommend to your attention, might be attempted. Make an opening a little above the symphysis pubis, in or near the *linea alba*, carefully avoiding the bladder; at this opening introduce one of your fingers, say the

fore finger of the left hand, so as to get a bearing on the uterus; this accomplished, take some slender pointed instrument, and pretty stiff, and by a sort of acupuncture, carry this instrument through the body of the uterus into its cavity, and on entering the uterine cavity, move the wire cautiously, yet effectually, in different directions, so as to break the ovum all to pieces, and put an effectual stop to the generative process. The ovum destroyed, draw up the *fallopian tube*, which is easily done, first on the one side, then on the other, cutting out a portion of it, so as to render it impervious, by which the woman would for ever afterwards become sterile. By this operation, successfully performed, you would at once secure the woman against the Cæsarean incisions, and preclude the risk of her ever becoming pregnant again. I shall hereafter lay before you some experiments I have made, which first led me to think of this expedient, and which induce me to believe, that unless the fluid discharged from the ovaries above may come into contact with the *seminal fluid* derived from below, a *new ovum* cannot be produced. Now this contact, the imperviousness of the tubes will effectually prevent impregnation .In performing the operation, I should be very careful to *break up the ovum thoroughly*, even if I laboured for fifteen or twenty minutes together.

But what is to be done in those cases, where a woman is known to have this contraction of pelvis, and though married, is yet unimpregnated? *Abstain.* But women have not always the power of abstaining, and unluckily they become pregnant. My friend Dr. Hall knew a woman who, having this sort of pelvis, was informed of it, and who, after abstaining some five or six years, in an evil hour, I know not how it was, (laughter,) became ultimately impregnated. In the early months of pregnancy, an operation to occasion the expulsion of the ovum was very properly attempted, but failed. In the course of two or three months after, labour supervened, but too late; the fœtus was too bulky, the parts became contused, and she died. Then what is to be done in the case of a woman so circumstanced and unimpregnated? If she distrust herself, I should recommend an operation, not, perhaps, wholly without difficulty and danger, but so far preferable to the Cæsarean incision, that I should not hesitate to advise it. I would make the small opening which I described before, not for the purpose of taking away the ovaries altogether, for that would unwoman her, but to take away part of the fallopian tubes; and this I should more especially recommend, if a woman laboured under a contraction of the pelvis from fracture, and if her general health were good.

LECTURES

ON THE

INTELLECTUAL COMPOSITION OF MAN

Delivered at the London Medical Society by

DR. HASLAM.

Lecture II.

On Language, considered as the Instrument of Thought; and on Numbers, as the Standard of Precision, and the Basis of Reason.

The state of the infant has been sufficiently considered in the former discourse. The gradual acquirements of perception and passive memory, have been noted; together with that degree of volition that serves to adapt the sensitive organs to their separate objects, and to direct the movements of the bodily frame. If man had been limited to these possessions, he would, like animals, have been stationary. If perception be nugatory without its associate, memory; what is the fleeting and perishable adjunct of human recollection, without a contrivance to preserve it? The wonderful instrument by which man becomes progressive, and acquires a superiority over all animated beings, was purposely concealed in the last lecture, in order to render its importance more conspicuous in the present, and thereby demonstrate his intellectual composition. This admirable engine for the rapid advancement of the human intellect, is speech, a convention between certain parts, the structure of which has been described with sufficient accuracy and minuteness; but the manner in which they co-operate to produce those sounds that are significant, has been hitherto but imperfectly considered. These parts have been termed the organs of voice; and the significant sounds they propel, are addressed to the ear. Therefore, speech is to be interpreted as a subsisting convention between the vocal organs and the sense of hearing. There are many sources of information that we constantly employ, and which contribute essentially to our comfort and convenience, without being acquainted with the means by which they act: thus most persons possess instruments to ascertain the temperature of the atmosphere, its gravity, and existing moisture, and likewise, to indicate the hour, without any knowledge of their mechanism: in the same manner they acquire language, and by habit employ it, without ever adverting to its nature and construction. Although a subject of the highest in-

ward upon the axis of the pelvis. Of this kind of distortion I here exhibit a very striking example, and I once possessed a cast, which some rude hand demolished, in which the acetabula and promontory were so nearly approximated, that the brim was, as it were, divided into three fissures, two laterally and one in front. At the outlet also the angular distortion occurs, and here it is occasioned by the approach of the tuberosities of the ischia and the incurvation of advance of the sacrum and coccyx, as this distorted pelvis shows, and gives rise, as at the brim, to a formidable contraction of the passage.

Well, what is to be done with women unhappily labouring under these distortions and contractions, whether of the elliptical or angular kind? What assistance can you afford them in their deplorable situation? If such a female is unfortunately pregnant, and in the end of her gestation, there are but two modes in which the delivery can be accomplished; the one is by *laying open* the child and reducing its bulk, the other is by performing the *Cæsarian operation*, in other words, by making an opening through the abdominal covering and uterus, by introducing the hand at the apertures and extracting the child by the operation of turning, as it is called. If the fœtus is to be abstracted in these cases by the natural passage, the head must be perforated, the contents must be removed, nay, sometimes the thorax and abdomen itself must be laid open, and when in this manner the bulk of the fœtus is reduced, and the parts are softened by putrefaction, it may at length be got away. Under circumstances of this kind then, it becomes a question whether you should perform the Cæsarean operation or the operation of *embryotomy*. Dr. Hall, of Manchester, and Mr. Burns, who has written so well on midwifery, have ascertained, that when the standard head is reduced, in the best possible way, to the smallest size, by the most expert operator, it will require, for its transmission, an aperture of three inches in its length, and in its breadth one inch and three-quarters; therefore if you find, upon examining, that no part of the pelvis is so capacious as this, it follows that the Cæsarian operation must be performed, and perforation is unjustifiable. After all, however, the mere capacity of the aperture will not enable us to decide, for not to mention the difficulty of ascertaining it with precision, much must depend on the skill of the operator, and one man may fail altogether in his attempt to deliver, when another may bring away the child with comparative facility. On the whole, perhaps, the rule may with advantage be laid down as follows:—If the passage of the pelvis be three inches throughout in length, and one inch and three-quarters throughout in breadth, and if the operator possess the necessary skill, then let him bring away the child by the operation of embryotomy; if, on the contrary, the capacity of the passages be not equal to that I have stated, and if the operator be wanting in dexterity, and unable to call in some person who may be more expert than himself, the Cæsarian operation must be performed.

A robust country woman, in vigorous health, the mother of several children, was thrown out of a cart, which went over her and broke her pelvis to pieces. She was carried home and lay a long time, but at last recovered. She again became with child, and was attended by a woman, but the pelvis was so contracted by the displacement of the fractured bones, and the mass of osseous matter by which they were consolidated, that the midwife was unable to deliver her. Mr. Barlow, of Blackburn, who used to relate the case, was called in, and found that she could not be delivered without the performance of the Cæsarean operation. As soon as she was willing to submit to it, feeling there was no hope in any other way, he performed it, and the child was extracted, but it was dead, (probably before the operation its vitality was become extinct,) but the mother herself did very well; in a fortnight after the incisions were made she got up, and in three weeks she was attending to her usual concerns. Now I mention this case as a rare instance of the success of the Cæsarian operation, for in general that operation, as performed at present, proves fatal. I mention it also as an instance of the operation being required, in consequence of the fracture of the pelvis, and a high contraction of it produced by this cause.

But I put another case, which ought to be duly weighed before you engage in practice, as the life of some unfortunate woman may depend on your previous consideration of it. I will suppose a woman has a high contraction, and is in the early months of gestation; I will suppose she may not have gone above one or two months: now in this case, of course it would, if practicable, be desirable to introduce an instrument into the uterine cavity, so as to *discharge* the *liquor amnii*, and in that way bring on a *premature delivery*; but very probably you might not be able to enter the uterus, nay, you might not be dexterous or fortunate enough even to feel the os uteri; now under these circumstances another operation, and an operation which I would strongly recommend to your attention, might be attempted. Make an opening a little above the symphysis pubis, in or near the *linea alba*, carefully avoiding the bladder; at this opening introduce one of your fingers, say the

fore finger of the left hand, so as to get a bearing on the uterus; this accomplished, take some slender pointed instrument, and pretty stiff, and by a sort of acupuncture, carry this instrument through the body of the uterus into its cavity, and on entering the uterine cavity, move the wire cautiously, yet effectually, in different directions, so as to break the ovum all to pieces, and put an effectual stop to the generative process. The ovum destroyed, draw up the *fallopian tube*, which is easily done, first on the one side, then on the other, cutting out a portion of it, so as to render it impervious, by which the woman would for ever afterwards become sterile. By this operation, successfully performed, you would at once secure the woman against the Cæsarean incisions, and preclude the risk of her ever becoming pregnant again. I shall hereafter lay before you some experiments I have made, which first led me to think of this expedient, and which induce me to believe, that unless the fluid discharged from the ovaries above may come into contact with the *seminal fluid* derived from below, a *new ovum* cannot be produced. Now this contact, the imperviousness of the tubes will effectually prevent impregnation .In performing the operation, I should be very careful to *break up the ovum thoroughly*, even if I laboured for fifteen or twenty minutes together.

But what is to be done in those cases, where a woman is known to have this contraction of pelvis, and though married, is yet unimpregnated? *Abstain*. But women have not always the power of abstaining, and unluckily they become pregnant. My friend Dr. Hall knew a woman who, having this sort of pelvis, was informed of it, and who, after abstaining some five or six years, in an evil hour, I know not how it was, (laughter,) became ultimately impregnated. In the early months of pregnancy, an operation to occasion the expulsion of the ovum was very properly attempted, but failed. In the course of two or three months after, labour supervened, but too late; the fœtus was too bulky, the parts became contused, and she died. Then what is to be done in the case of a woman so circumstanced and unimpregnated? If she distrust herself, I should recommend an operation, not, perhaps, wholly without difficulty and danger, but so far preferable to the Cæsarean incision, that I should not hesitate to advise it. I would make the small opening which I described before, not for the purpose of taking away the ovaries altogether, for that would unwoman her, but to take away part of the fallopian tubes; and this I should more especially recommend, if a woman laboured under a contraction of the pelvis from fracture, and if her general health were good.

LECTURES

ON THE

INTELLECTUAL COMPOSITION OF MAN

Delivered at the London Medical Society by

DR. HASLAM.

Lecture II.

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The state of the infant has been sufficiently considered in the former discourse. The gradual acquirements of perception and passive memory, have been noted; together with that degree of volition that serves to adapt the sensitive organs to their separate objects, and to direct the movements of the bodily frame. If man had been limited to these possessions, he would, like animals, have been stationary. If perception be nugatory without its associate, memory; what is the fleeting and perishable adjunct of human recollection, without a contrivance to preserve it? The wonderful instrument by which man becomes progressive, and acquires a superiority over all animated beings, was purposely concealed in the last lecture, in order to render its importance more conspicuous in the present, and thereby demonstrate his intellectual composition. This admirable engine for the rapid advancement of the human intellect, is speech, a convention between certain parts, the structure of which has been described with sufficient accuracy and minuteness; but the manner in which they cooperate to produce those sounds that are significant, has been hitherto but imperfectly considered. These parts have been termed the organs of voice; and the significant sounds they propel, are addressed to the ear. Therefore, speech is to be interpreted as a subsisting convention between the vocal organs and the sense of hearing. There are many sources of information that we constantly employ, and which contribute essentially to our comfort and convenience, without being acquainted with the means by which they act: thus most persons possess instruments to ascertain the temperature of the atmosphere, its gravity, and existing moisture, and likewise, to indicate the hour, without any knowledge of their mechanism: in the same manner they acquire language, and by habit employ it, without ever adverting to its nature and construction. Although a subject of the highest in-

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terest, the organic part of speech has been inadequately considered: it is indeed a subject of great complexity, but it is the legitimate province of the anatomical proficient and physiologist to investigate, in order to solve the difficulties of this intricate question. It is sufficient for the present purpose, to know that the lungs are the grand reservoir of air or breath, that the larynx and parts connected with it produce the adequate dilatation and compression, and that, by the parts composing the mouth, the volume of air is so modulated, as to produce the intended sound: therefore, there are certain vocal sounds that are denominated labial, nasal, dental, palatick, guttural, &c. according to the presumed instrumentality of these parts to their formation. The proof that speech is conventional between the vocal organs and the ear, arises from the fact, that those who are born with their ears impervious to sound, are dumb; by not possessing the means of acquiring spoken language, in the direct and ordinary manner: and which appears to be a triple process. 1st. The perception of the object by the sensitive organ; 2d. The comprehension, that the sound or word is the substitute for the object perceived; and, 3dly. The imitation of the sound for its practical employment. In an endeavour to ascertain the manner in which our perceptions are remembered, it was observed at our last meeting, that the organ of vision, was endowed with superior sources of memory, by being enabled voluntarily to revive the phantasm of the object seen: indeed, when the object, and the name by which it is distinguished, are familiar, the mention or recollection of the name, will excite the phantasm: and the recurrence of the object in nature, or by the phantasms that take place in our reveries and dreams, or in delirium, will recall the name. Something similar, but in a minor degree, takes place with the perceptions of the ear: but as each of our sensitive organs conveys intelligence in a different manner, no analogy can be established: that which the ear receives, can only be directly communicated by the voice; and the articulations of the vocal organs can only be addressed to the ear. In the other senses, no phantasms are excited in a sound state of the organs; their memory is passive, that is, they require the objects to be presented again, in order to claim them as former acquaintances; and, which is most important, their recollection can only become an act of the will, by substituting a name, as the representative of the perception. From the time that the object in its absence, can be recalled by a name, generally understood, the rapid progress of the intellect commences: and it will now be evident, to how great an extent the memory must be improved, and its facilities augmented, by the substitution of language for our perceptions. It would be superfluous to trace the gradual advancements, by which the child attains the rudiments of speech; they may be readily observed, but the description would be tedious. It is sufficient to remark, that the kindred spirits of curiosity and imitation, which are early developed, produce hourly additions to the vocabulary, and improve the pronunciation: and the vigour that speech imparts to the memory, may be illustrated by the fact, that none of the occurrences of infancy, however signal or impressive, are remembered; and, that the earliest recollections are of circumstances that have happened, after the child has acquired some proficiency in language.

It is generally agreed, that no animal, under any circumstances or manner of tuition, is capable of acquiring speech for the purposes of communication. This investigation is in some degree connected with the organic doctrine of articulate sounds, and likewise demonstrates the nobler capacities of the human species. Some of the feathered tribe, will pronounce many words, and even sentences, in a manner perfectly intelligible; and it is worthy of remark, that such are not, in general, the birds of song. It therefore appears, that the physical structure of the vocal organs, by which words are pronounced, is not peculiar to man; and the anatomist will of course, by some congruity of apparatus, give sufficient reasons for this successful imitation of the human voice: but it has never been seriously asserted, that these birds comprehended the meaning of the words they uttered. This circumstance, namely, the ready comprehension that the vocal sound or word is the representative of the perception, constitutes the broad and palpable distinction between man and animals. We may allow, that some of the quadrupeds, in their domesticated state, may be impressed with the meaning of a few words of command, that have been frequently repeated; but these animals have never attempted to imitate the sound: and those birds that can readily pronounce several words in succession, or sentences, have neither understood the aggregate, nor the individual words, of which the sentence is composed; and both of which are indispensable for the comprehension of speech. The intelligence of the quadruped is vastly superior to the capacities of the feathered creation, and the only conclusion that can be drawn is, that the former wants the power of imitation, and that the latter is incapable of understanding the meaning of that which it utters; and therefore, that neither is competent to the acquirement of speech. The fact is however, interesting, as it evinces that the mimicry of intelligent

sound, is a talent altogether different from that comprehension of meaning, by which man describes his perceptions, and promulgates his thoughts.

We shall now abandon the brute to its mute docilities, and vocal insignificance, and proceed to a more intimate examination of the instrument of human progression. Children acquire speech by residence and the ordinary intercourse with persons of whatever nation, and become capable of fluent conversation, without being taught the principles of the language: and in this uneducated state, many of our species pass from the cradle to the grave; their phraseology, and the construction of their sentences, are in conformity to the models from which they have derived their diction: and this is an additional proof, when the substitution of the name for the object is comprehended, that the acquirement of speech is the mere act of imitation. Let us grant, that speech has been correctly learned; to what does it amount? What is the extent of the convenience it affords, and of the intelligence it conveys? It is the medium of reciprocal communication, which the pantomimic exhibition of gesture could not impress. Of the present, it imparts all that immediate suggestion can detail:—of the past, it can recite the series of events, within the bounded sphere of its own recollection, and wanting a superior promise, it might impotently speculate on the probabilities of the future. Speech can express the individual facts of perception, and the generalities that abound in nature: it bestows the ornamental graces on conversation, and calls forth those glowing metaphors in which poetry is arrayed, and which render the orator attractive; together with all the abstractions that are the coinage of a fertile imagination. The utterance of significant sound is able to impart our immediate feelings, whether we supplicate a higher intelligence, or bestow the eloquent tributes to friendship and affection: its subtleties are admirably calculated to evade the truth, and equally fitted for the unblushing avowal of falsehood; to propagate slander, and in its subdued tone, to circulate the whispers of detraction. These vocal representatives of thought and emotion, may be bandied from mouth to ear, while the man survives: but at his departure, all the effusions of his genius, the maxims of his wisdom, the hoard of his experience, and the reflections of his mind, perish. By mere speech, man is circumscribed into the creature of his own day: the intellectual treasures, which his ancestors may have possessed, are buried and decomposed, and his own accumulations have no inheritor. In this state, limited to oral communication, and destitute of a character, by which human events and opinions are recorded, there are, even at this period, many populous communities in existence. For immediate intelligence and personal communication speech is sufficient: but, for the advancement of our species, for the conveyance of thought beyond the perceptive influence of the ear, and to transmit our achievements to posterity, an additional agent must be employed; and this consists, in some permanent character, that equally registers the sound of the word, and preserves its meaning. The composition of this record from alphabetic characters is evident, and constitutes the foundation of our literary instruction. In this process, significant sound, which had been exclusively addressed to the ear, now becomes the joint property of the organ of vision. By the arrangement of these component symbols into words, and by their selected multiplication into sentences, the eye imbibes the same material that the ear absorbed: but according to the different manner of conveyance, which each sensitive organ enjoys, speech necessarily implies intonation, and written character is silently transmitted. But this silent reception of intelligence, so coalesces with the functions of the ear and voice, that the subaudition is reciprocal; so that, by the simple visible perception of these characters of significant sounds, the voice can proclaim them aloud and the ear become its evidence. The rapidity with which these separate communications are executed, to unlettered persons, is perfectly astonishing; yet they are regularly successive. The eye must perceive the word, and its appropriate sound must be recollected, before it can be uttered by the voice, and be intelligibly directed to the ear. To render the acquirement of language complete, and adapted to fulfil its purposes, there still remains a desideratum, which is the ready formation of these alphabetic characters, termed hand-writing: and although many persons have learned, by the eye, to comprehend and pronounce, printed or written words, yet they remain deficient of the skill, and directing movements, by which they are executed. This performance involves the sense of touch, with its conjoined facilities of adaptation and prehension, together with the co-operation and immediate guidance of the eye. The multitude of human affairs that press on those actively employed, necessarily produces an abbreviation of language, both of its sounds and characters, for convenience and dispatch: for it must be recollected, that the perfection of a language, consists in the perspicuous conveyance of our thoughts, by the shortest means: and as we penetrate further into this subject, we shall be aware that the construction of a clear, and definite sentence, is one of the highest efforts and

proudest attainments of the human intellect. Before we can advance in any department of learning or science, it is absolutely necessary that the significance of the terms we employ, should be individually comprehended, in order that they may be conjoined for the purpose of expressing our thoughts.—This is the philosophy of language; and respecting our own, there is sufficient evidence, from its structure and composition, and from the materials we possess of its early foundations and progressive history, to conclude that it was of a rude and barbarous origin. But time, the purer construction of the ancient tongues which have served as the models of improvement, and the endeavour by translation to transfer the spirit of the originals into our native language; have considerably promoted its present state of comparative perfection. For purposes that will be developed hereafter, it is proper to notice that all the particles, whether prefixed or postponed, together with the inflections of certain parts of speech, are abbreviations of actual words for convenience and dispatch. There can be nothing fortuitous in language; its structure is the type and emblem of the intellectual culture of the people who employ it: and it therefore becomes an infallible criterion of the state of the human mind, and of the progress of civilisation. The abbreviation that is most generally employed, and is of the greatest utility, is the art of shorthand, which still admits of considerable improvements, and ought to be considered as a branch of education: for, until the hand can keep pace with the speaker, and readily reconvert these abbreviations into speech, or the ordinary character of writing, the art is defective. Finally it has been projected, by some literati, to construct what they have termed a real character, or philosophical language: and as far as their meaning and object can be detected, which is extremely difficult, it is a proposal to contrive some general representative of thought, in which the wise men of all nations might communicate and correspond; but after many infructuous efforts, the scheme was abandoned. If my own opinions on the nature of thought be correct, such contrivance is an utter impossibility: and had they thoroughly comprehended the nature of language, they never would have made the attempt.

In the investigation of the intellectual composition of man, that has been already instituted, his perceptions and associated memory have been noted; together with that degree of volition, that contributes to their more perfect exercise: language has likewise been furnished, whereby he can commute his perceptions for significant sound, and voluntarily produce them, to describe the phenomena of nature, the peculiarity of his opinions, and the impressions of his feeling. He has been taught the alphabetic elements and their arrangement in order to unravel the records that preserve the transactions, and embalm the wisdom of his ancestors; and to complete the purposes of language, he has acquired the dexterous formation of these symbols, in order to transmit the elaborations of his thought to his remote contemporaries, and to a distant posterity. Thus his name lives when his corporeal structure is decomposed, and blended with the earth he inhabited. Independently of the illustrious monuments of invention, of taste and of wisdom, that we derive from the polished nations of antiquity; there are names, the produce of our native soil, that will never perish while valour, genius and virtue, are held in estimation.

By these powerful instruments of communication and record, man can inherit the intellectual treasures of preceding ages, and bequeath to future generations the enduring legacy of his own accumulation.—These high possessions are beyond the comprehension and attainment of animals; and it is now the proper moment to communicate that such incapacities have rendered them stationary. Under the immediate direction of human sagacity, their docilities may be augmented, and by judicious breeding, the bodily proportions of their race may be improved. But that which they have been forced to acquire, they never attempt to teach; it is exhibited only by coercion, and never spontaneously practised: and left to their own guidance, their corporeal ameliorations soon degenerate. When the abundant materials, (even from the sources already enumerated,) that compose the human mind, are duly contemplated, we shall cease to wonder at the long period that elapses before man arrives at the maturity of his intellect; such are the elaborate composition and superior destinies of his nature. Even with the attributes that have been recorded, the foundations of his mind are still defective. These acquirements, in their utmost perfection, could only render man the creature of abstract description and eloquent generalities; admirably competent to embody fiction and adorn fact; fitted to become the splendid orator, and to breathe forth the inspirations of the poet. In the full enjoyment of these excellences, he would still want some standard by which he could institute accurate comparisons; some equal balance to indicate the preponderance, and some unerring test to determine the proportions of matter. For time and space he would require some precise admeasurements, and for all property some definite estimates of value:—these can only be ob-

tained by the knowledge of numbers, by which all computations are effected, and into which all estimates, ratios, and proportions are ultimately resolved.

On Numbers.

The civilised community in which we exist, has provided for all the exigences of our nature, physical, intellectual, and moral. We are propelled into a world ready furnished, supplied with all the conveniences of human requisition, and therefore become more the beings of enjoyment than of investigation. In a state of luxurious repletion, we seldom inquire how the dainties have been procured. These observations especially apply to the doctrine of numbers: we are impelled forward to surmount the difficulties they can solve, but are little disposed to revert to the history of their invention, or to analyse the nature of their composition. The comprehensive generalities of language describe immense armies—a prodigious population—the cloud-capt mountains—and the profound abyss of the ocean: but these swelling attributes convey no precise estimate, or definite calculation. It is therefore necessary to employ some criterion which can accurately define the assembled individuals, and the elevation and depth from a certain position. When we inquire into the origin of numbers, we are involved in considerable perplexity: the genuine history of this contrivance is altogether wanting, and enveloped in fables not worthy of being repeated, yet it is evident that they must have been consecutively noted; that is, they must have commenced with unity, and have proceeded in a series from one to ten. It is equally curious, that in the polished nations of antiquity all integral numeration concluded at ten, and that eleven is a term compounded of the words denoting one and ten. Our northern ancestors have denominated eleven one left, that is, one remaining after ten have been counted. If we seek the extent of numeration among some less civilized tribes, we shall find that it terminated at five, and that six is compounded of the words five and one, and proceeds to ten by the same manner of composition. In our own language, the names that denote the units do not admit of any similar explanation by any ostensible etymology, nor can we trace the origin of their names to any probable sources. In the Mæso-gothic, the venerable parent of the northern dialects, the verbal sign after ten is indicative of the numeral composition; that is, the word by which it is designated, is a compound of the words composing the two numbers combined,—and our own language follows the natural order of such composition. Thus we have twain-ten, or twenty, proceeding to a hundred, which means ten rows of ten each until we arrive at a thousand, the import of which is two five hundreds. These illustrations, which may appear recondite and perhaps superfluous, have been adduced to show, that although the history of numbers is imperfect, yet the means by which the intellect arrived at numerical progression, is clear and satisfactory. If it be inquired what is the extent of the operations of number, the answer is definite and certain. However complicated the rules of arithmetic, however disguised its abbreviations by algebra, the power of numbers can only consist in additions to existing numbers, or in substractions from them. These two operations are all that are within the reach of the human mind. Numbers, or figures their representatives, are applied, as the accurate criteria of quantity, time, space, and value, and these can only exist in the excess or diminution of some definite standard. It is wholly unnecessary for the present purpose, to treat more largely on the philosophy of numbers: but it will be expedient to exhibit their utility and application to the ordinary purposes of life; and to prove, that without their conjunction with language, man could not become a member of a civilized community, he would be an imperfect constituent of a pastoral nation: he could not blend with an agricultural state, and he would be wholly incapacitated for all commercial relations: but above all, however voluble his speech, however select and expressive his phraseology, he could transact no business, nor ever attain the dignity of a man of science. For the purposes of definite estimate, numbers are necessarily connected with all the objects and movements in nature, and these alone constitute the standards of precision. Such is the unvarying accuracy, yet pliant adaptation of numbers, that they can determinately characterise all the forms of estimate, and be affixed to all the perceptions we derive from our sensitive organs. The divisions of time that have been established, enable us to denote the present, and to admeasure the past for ages that have lapsed, which constitutes chronology, by annexing to events the precision of a date. In the examination of space, whether we compute the surface of the globe we inhabit, or the distance between given positions; whether we ascertain the elevation of mountains, or fathom the depths of the ocean; the definite result must be conveyed by numbers. Even the instruments we employ, as the standards of correctness, have their sources and determination in numbers. That prominent feature in the human character, the lust of possession, has converted to value not merely the surface of the earth, but also its interior

recesses. Property comprises all the products of the animal, vegetable, and mineral kingdoms. Even the birds of rapid flight and delicious flavour, are claimed by the proprietor of the district through which they pass, and the wilder quadrupeds are equally the subjects of appropriation: these are moderate assumptions. But man himself becomes the object of a bargain:—he is driven to the market, like an ox unto the slaughter;—his fine proportions are eulogised by the appraiser, his prowess is displayed, and his abject submission warranted to enhance his price. Even sex claims no exemption from this iniquitous traffic, and the offspring becomes the slave of the purchaser. Such is the cupidity of man, that were his power unlimited, he would have monopolised the host of heaven,—and sold a planet by private contract, or knocked it down to the highest bidder. The representatives of value are the multiplications or subdivisions of a standard, and although they vary in different countries, are all ultimately resolvable into numbers. The operation of numbers may be correctly considered either as an abstract science, or as connected with the useful purposes of our nature. The addition or substraction of figures may constitute a simple and independent process, or they may be conjoined to the forms of matter, to space, to time, or to value. Thus the accurate chemistry of our own day is expressed in numbers, and in their fractional divisions. The admeasurements of the existing temperature of the atmosphere, together with its gravity and prevailing moisture, can only be indicated by a scale numerically constructed. The specific weight of solids, fluids, and even of gaseous substances, can only be characterised by number. The preparation of medicinal compositions, and their distribution into certain doses, and also the particular times when they are to be administered, imply the numerical divisions both of weight and of time. It would be useless to enumerate further instances of the indispensable application of numbers:—their utility becomes evident on the slightest consideration, although their immense power and higher employments have been unnoticed. They are the immediate instruments of all ratios and computations, and constitute the ground work of the whole range of natural philosophy, and, on a future occasion, will be exhibited as the basis of reason. Furnished with these intellectual components, man is prepared to compete with his fellows, and to assume his rank among intelligent beings. He has now acquired the elements, from which his mind may proceed to the display of reason, and to the elaboration of thought. He is now sufficiently instructed to survey the world in which he exists, and to comprehend the acts of its inhabitants, in order to determine on the objects of his ulterior pursuits: for the rudiments he has attained, equally qualify him for accurate observation, and for the higher energies of reflection. Having become familiar with the exercise of speech, and with the construction of his native tongue, he is more readily enabled to extend his researches for the possession of others; and thus to imbibe, from their immediate sources, the eloquence and wisdom of the Grecian and the Roman models. On these solid foundations he may erect the edifice of learning; and by the patient devotion of his mind to the standards of excellence, he may surmount the difficulties of composition, and convey his opinions in perspicuous and connected sentences. He may seek advancement in the departments of the law,—or, directed by more solemn views, he may reluctantly aspire to the preferments of the church:—and if his industry be equivalent to his talent, he may be distinguished as an honourable and skilful member of our own vocation;—a profession whose basis consists in the union of learning and of science;—and whose superstructure is experience expanded by reason, and condensed by thought.

LECTURES ON CHEMISTRY,

BY

PROFESSOR BRANDE,

Delivered at the Royal Institution of Great Britain.

LECTURE I.

We are assembled, here, Gentlemen, for the purpose of commencing a course of lectures on Chemistry, and I shall endeavour to state to you the objects of the science in general terms, and to give you an account of the order of study which will be adopted.

I need scarcely state to you that the term chemistry was employed by the old chemists to denote the science of the transmutation of the metals, and the conversion of the various metallic bases into gold; and the alchymists, as they were called, who pursued these experiments, had another object in view, namely, the discovery of an universal remedy. With regard to the first of these objects, the transmutation of the metals, it is not surprising that they should conceive such a thing possible, especially when you reflect on the separation of the metals from their ores, and that from many of these,

very unpromising bodies in appearance, some of the most valuable metals are obtained, as is the case with iron, which they succeeded in reducing from what in appearance are mere stony ores, and it seems to me that considering that they had transmuted these bodies into iron, there was some plausibility in the notion that they should be able to convert some of the less precious into the more precious metals. You may also find a similar explanation for the other object of the alchymists, namely, the discovery of a panacea, or an universal remedy; for, finding that the metals possessed very energetic powers in the cure of certain diseases, they imagined that, having done thus much, they might do more, and discover an universal remedy.

It is to the labours of these persons, who flourished in the middle or dark ages, that chemistry is indebted for many valuable discoveries; they discovered a great number of the metals, many of the acids, many of the salts, and spirits of wine, which were not known at any previous period, and therefore the origin of chemistry is undoubtedly with the alchymists. But if you choose to trace the history of the science to a more remote period, you will find, in holy writ, mention made of the fusion of different metals from their ores, and so on, which implies a degree of chemical knowledge; but the rationale of the process was then unknown. It was not, however, until a very late period, comparatively speaking, that chemistry began to assume the form in which we now find it, and to acquire a truly scientific aspect. There were, it is true, many chemical facts distributed over a number of works, but the science appeared to proceed rather as a matter of choice than of experimental inquiry. At the beginning of the last century, however, the facts discovered by the alchymists, were gradually examined and classed, and re-examined upon scientific principles. Stahl and Beecher distinguished themselves in Germany, and in this country Drs. Hales, Hooke, and Mayow, rendered many valuable services to the science. Then if we take a step to the middle of the last century, to the period between 1750 and 1760, we find that a number of persons, whose names are very familiar to you, Priestly, Lavoisier, Cavendish, Scheele and Black, studied chemistry upon very scientific principles, and added exceedingly to the number of its discoveries. They did more, however, than this, because they showed that chemistry was capable of very numerous and valuable applications to the arts, and they made such applications of it with great success. Soon after the period last mentioned, Lavoisier explained a great number of chemical facts, unknown before his time, and classed them together, so as to form a system of chemistry, the first of the kind, which was published in France, in the year 1777. Dr. Priestley, about the same time, made a number of very valuable acquisitions to the science, by the discovery of a number of gaseous or aeriform bodies; for although it was known before his time, that there were two or three different kinds of air, yet they were only regarded as atmospheric air, loaded with certain vapours. He pointed out their distinct nature, and you will find that the gaseous or pneumatic chemistry, as it was called, contributed a number of important facts to the science. Matters remained pretty much in this state, until the science received a new and very important stimulus in the early part of the present century, by the discovery of what has been called Galvanism; or I ought rather to say, by the discovery of the relations of electricity to chemical changes. The discovery originated with Volta, was improved upon by Galvani, and has been pursued by several experimenters in this country, but especially by Sir Humphrey Davy, to whose brilliant investigations on this subject, chemistry is mainly indebted for the great and rapid progress which it has made in the last twenty-five years.

It is not easy to give a very unobjectionable definition of chemistry. Dr. Black defined chemistry to be "a science which taught us the results of heat and mixture upon bodies;" and, certainly, to examine into the changes produced upon bodies, by heat and mixture, may be stated to be a main object of chemical investigation; but I should be inclined to make an addition to this definition, and to say, that chemistry is the science which teaches us to examine and inquire into the composition of bodies generally, whether effected by heat and mixture, or any other means; to inquire into the changes resulting from the mixture of bodies, and into the causes of these changes. Accordingly, the chemist is enabled to divide all bodies in this way, into two great classes, namely, into *simple* and into *compound* bodies; and in examining the various products of nature, infinite as they appear to be, we shall find that in the present state of our knowledge, there are not more than about fifty or sixty elementary or simple bodies, and that by the union of these, the immense and diversified masses of matter upon the surface of the earth are formed. The term element must not be confounded with what the ancients called the elements, which you know were, according to them, air, water, earth and fire, from which they supposed all other substances were formed; nor the additions which the alchymists made to those of salt, sulphur, and mercury; but we understand by the term, a number of ea-

sentially elementary bodies, the further decomposition of which has baffled our analytical skill. But, as you will by and by find, we often see certain qualities in these bodies which lead us to suspect that they are of a compound nature, and some chemists have gone so far as to consider their suspicions almost proof, and have called even the metals compound bodies from analogy. I shall, however, show you the necessity of adhering to matter of fact, and not to assume any thing which has not been proved by experiment. Chemistry being purely a science of experiment, it is impossible by deduction or mathematical inquiry, to arrive at the knowledge of a chemical fact. At the same time it is right to say, that the barriers between the several sciences are giving way; and that chemistry is almost imperceptibly merging into mechanical philosophy.

When you look at the number of objects presented to you by nature and art, and when you reflect that they are all of them matters of chemical inquiry, you will be somewhat appalled at their number, and consider that the difficulty of arranging them is almost infinite. Arrangement and order will do a great deal in cases of this kind; and I shall now proceed to show you the arrangement we shall adopt here; not that I mean to say it is devoid of fallacy, but I consider it the best a teacher of chemistry can adopt. In the first place it is obvious that the chemist has to inquire into the powers which effect chemical changes. We have before us a number of simple or elementary bodies constantly assuming new forms, and we have to examine into the causes of these changes; we shall find them in the great powers or properties of matter of which we know nothing as to their cause, and these are *attraction*, *heat*, and *electricity*; and it will be necessary to examine these powers generally as chemical agents, and afterwards their mode of action upon individual bodies.

Now with regard to *attraction*, it is customary to divide it into *homogeneous* and *heterogeneous*, or into mechanical and chemical attraction. By the first term is generally understood that attraction which causes the particles of a body to adhere to each other; and the same power which influences the particles influences the mass, and gives to bodies the power of what is called *gravitation*, preserving the planetary bodies in their proper movements and causing bodies projected from the earth to be attracted again towards its centre. Attraction operating on similar particles, causes adhesion of these particles; and when acting upon dissimilar particles, produces chemical change. Here, for example, is a piece of white marble: if I throw it into the air, it is attracted toward the centre of the earth by gravitation, and its particles are held together by the same power, then called the attraction of cohesion; but if I examine its composition minutely, I shall find that it is composed of carbonic acid and lime, and these are kept together by what is called chemical attraction or affinity, which will be described more at length in the next lecture. Sometimes this attraction takes place without producing any regular form in the shape of the body, at others, the most beautiful regularity may be observed; and in crystallisations you have examples of this. Now it is the business of the chemist to study these forms, and to investigate, as far as he can, the causes of these forms, because they assist him in arriving at a knowledge of the nature of their compositions. In examining into chemical affinity, we shall make you acquainted with the general terms usually employed, and with some of the common results of this species of attraction; but here we shall only give you a general outline of the subject, because the whole course will consist of an explanation of the causes and nature of chemical change, the result of chemical affinity, or attraction. Having thus examined attraction as causing chemical change, we shall proceed to examine how far it is influenced by *heat*; we shall endeavour to show that heat gives to bodies a repulsive energy and enables them to overcome the attraction of cohesion, and give examples of its power of converting solids in aeriform bodies. Our inquiries into the phenomena of heat will be first general, and then particular; we shall examine its general effects in nature, and during the course shall trace its influence upon bodies more particularly. We then come to *electricity* as a chemical agent; and here the chemist has great difficulty in drawing the line between such phenomena as are strictly chemical, and such as belong to mechanical philosophy, or to other branches of philosophical inquiry. However, we shall endeavour to point out the general phenomena of electricity, and the influence which they exert upon chemical change. It was, as I have stated, at the commencement of the present century that Volta made the capital discovery of the accumulation of electricity, by the contact of metallic substances. Volta hit upon a mode of accumulating the electricity thus produced by the contact of metals, and the instrument thus made has been since called the Voltaic pile, and from the share Galvani had in improving it, the Galvanic battery; and it has been found to be a very useful instrument in prosecuting chemical inquiry. Now then these subjects, namely, attraction, heat and electricity, will, as I have stated to you, be brought before you generally at the opening of the course; and they will constitute the first division of it. We shall then proceed to examine the materials upon which these

agents are acting, and the changes which they produce on them.

Now with regard to matter, it may be divided into *two great classes*, the gaseous, highly attenuated and imponderable, to which the term *radiant matter* has been given; and I need only advert to light, to radiant heat, to the different rays of the prismatic spectrum, to furnish you with instances of different kinds of radiant matter concerned in chemical changes and the influence it exerts on them.

Then in regard to *ponderable* bodies, they may be divided into simple and compound; and upon this principle chemists and chemical writers have founded their arrangement of different substances. They have described, first of all, the simple or elementary bodies, and in the next place the compounds resulting from their union; and it was urged that this was the best way of making the student acquainted with them, namely, first to describe the simple, and then the compound bodies. Another arrangement has been made of substances into the supporters of combustion and combustible bodies; but I shall not stop to explain these now, and refer to them merely to show you the classifications which have been proposed. The basis of our arrangement of these substances will be founded upon their *electrical relations*: and taking them to be about fifty-four or sixty in number, you will find that some of them are uniformly attracted by substances rendered positively electrical; and we infer from certain circumstances to be pointed out hereafter, that they are naturally in an opposite state of electricity. There are three simple bodies of the first kind, or supporters of combustion; namely, *oxygen*, which is a simple body in a gaseous form when uncombined; *chlorine*, also a gaseous body under common circumstances, but existing as a liquid at very low temperatures, or under considerable pressure; and *iodine*, existing as a solid body. Now we might show you that oxygen is always permanently gaseous, and chlorine a liquid, and iodine a solid body; and that these three, which are electrio-negative bodies, are always attracted by the positive pole. We might describe the properties of oxygen, then those of chlorine, and then the properties of iodine, but we shall adopt a different plan; for having described the sources and properties of oxygen, which by the way is a very important body, constituting a large portion of the ponderable matter of our globe, about a fifth part of the atmosphere and eight parts in nine of water; having, I say, pointed out its properties, we shall proceed to examine chlorine in the same way, to show you its sources and general properties; and then, instead of passing on to the third body of this class, namely, iodine, we shall examine the compounds which oxygen and chlorine form with each other, and in this way we shall avoid much of the perplexity in which the subject is usually involved. Having given you an account of the compounds of oxygen and chlorine, we shall proceed to an examination of iodine, and exhibit to you the compounds which it forms with oxygen and chlorine. There are, perhaps, two or three other bodies which belong to this class; as for example, fluorine and some others; but as they have never been exhibited in a separate state, we cannot be certain of it, and we infer that they belong to this class, from certain habitudes which they manifest in combination.

Then we come to the consideration of the *electro-positive* bodies, or such as are attracted by the negative pole, and you will find them to be *hydrogen*, which is a gaseous body, the lightest in nature: *nitrogen*, another gaseous body, *sulphur* and *phosphorus*, solid, inflammable, and easily fusible bodies, and *carbon* and *boron* inflammable, but infusible bodies, or nearly so; and to this class may be added all the metals. I shall not, however, enter upon the consideration of these now, further than to remark, that there exists a great analogy between them, and although each has some properties by which it is distinguished from the others, yet that there are certain properties possessed by them in common, sufficient to constitute a distinct class, and one of these is their attraction by the negative pole of an electrical apparatus. In the next place, we shall examine hydrogen and its combination with oxygen, so as to form water, which becomes an important subject of chemical inquiry, and the discovery of the composition of which may be regarded as one of the most important of modern times. Having done this, we shall proceed to its combinations with chlorine and iodine. Then we shall take up nitrogen in the same way, and its union with oxygen will lead us to inquire into the composition of atmospheric air, its properties, and general characters and latitudes; and so we shall go through the various substances, examining them first in their separate states, and then in their relations to each other. Now with respect to the metals, these will form a very important feature in our inquiries; they are a very numerous class of bodies, and many of them are of extreme importance in the arts, and in medicine especially. The chemical history of the metals includes a number of collateral branches of inquiry, into which we shall enter as far as our time will permit: in the first place we shall point out the state generally in which they are found in the earth in the form of mineral ores; secondly, describe their localities; and, thirdly, the

general mechanical properties by which they are distinguished from each other. This constitutes a branch of science called mineralogy. Another collateral subject connected with this, is the mode of extracting metals on a large scale from their ores; the manner in which these are worked, and reduced to the state of purity in which they are brought into the markets. The manner in which ores are reduced upon a large scale, involves many processes, which will be pointed out to you generally, and this branch is called metallurgy, or the extraction of metals from their ores. Many of the metals combine with each other, and many of these combinations have been applied to most useful purposes in the arts; and when speaking of iron, we shall explain to you its combination with carbon, so as to produce steel, and the various purposes to which such compositions are applied.

We shall also have to describe their medical applications, which has been called pharmaceutical chemistry, and part of the science is often spoken of as if it could be studied apart from the rest; but it is only since pharmacy has been studied as a branch of general chemical science, that any true knowledge of it has been acquired. One of the most valuable discoveries, namely, the separation of the active principles of plants, as quinine from bark, morphia from opium, and so on, interesting to the philosophical chemist, and of great importance to the medical practitioner, may be pointed out to you as resulting from chemical investigation; these, however, will be pointed out more fully to you by and by. We might also advert to the treatment of persons poisoned by metallic substances, as illustrating the importance of a knowledge of chemistry. In many cases, our knowledge of the nature of the compounds formed by the union of the metals with different substances, will enable us to discriminate such as are innocent from such as are hurtful, and teach us to prescribe accordingly. With the history of the metals, we shall conclude the history of the elementary bodies, and of their various mutual combinations, as far, at least, as they are independent of organisation; but we have for good reasons set apart those which are the result of life or organisation, as requiring a distinct and particular mode of investigation. We shall have to show you, that in the vegetable world, from the moment a seed begins to grow, it is performing a class of chemical operations upon the air and soil. But the mode of performing these operations is perfectly distinct from any thing that can be artificially represented, because they are under the influence of the vital principle of the plant, and consist in the selection of certain elements from the soil and air for its development and support. It is necessary however for the chemist to inquire into these operations, which end in the production of a variety of vegetable products, as gum, sugar, starch, acids, and alkaline substances, and so on; and a great variety of vegetable products will be examined in detail, not merely regarding the mode of their formation generally, but also in regard to their applications to the arts.

I think necessary to state to you, that the chemistry of the arts will be in all cases entered upon as far as our time will allow; and although the details of the workshop cannot be gone into for want of time, yet we shall in all cases develop all the principles of the arts, and show you some of the manipulations, where they are important, of the artist's shop. Some of these would require an entire course for their elucidation; take, for example, the arts of dying, bleaching, tanning, calico-printing, and so on. We must adhere to the abstract principles of the science, and go into their details as fully as our time will allow; so that when you visit a manufactory, you will not be wholly ignorant of the principles of the processes which you may see then going forward.

Another interesting branch of vegetable chemistry is *fermentation*, or the production of vinous and acetous liquors from certain vegetable products. The principle of this change is simple enough; but you will find that the causes of the various flavours of the wine and beer, and other fermented liquors, depend upon trifling circumstances, and are much under the control of the manufacturer, who adopts particular processes sometimes for particular ends. In regard to vegetable, as well as animal bodies, the modes of analysing them will be pointed out, and it may be well to state to you, that there are two modes of analysis resorted to, the one teaches us the nature of their ultimate parts, which we shall find to consist of carbon, hydrogen, and oxygen for the most part, and the mode of determining the relative quantities of these, will be shown; and the other mode of analysis teaches us the quantity of gum, resin, sugar, and so on, in a body, which are called the proximate elements; and in this way we shall arrive at a knowledge of the various vegetable and animal substances, distinguishable from each other by their chemical habitudes. The old chemists had very little idea of the nature of animal substances; they considered that they were composed of various materials, such as air, earthy matter, water, and oils, and so on, which they obtained by distillation; but of late animal chemistry has acquired considerable interest, and has been studied upon more philosophical principles. In examining animal bodies, our first question is, which are their ultimate compounds? We shall find that

they are few in number, but that the secondary products to which they give rise, are very numerous: carbon, oxygen, hydrogen, and nitrogen, being the ultimate elements; and proximate elements, albumen, jelly, fat, different acid and alkaline substances, and so on. We shall show you the mode of analysis by which all these may be obtained, the relations of these substances to each other, and the various circumstances under which they are applied in the arts, many of the arts depending, as I may say, upon the chemistry of animal bodies, as, for example, tanning, and so on.

The functions of animals have been examined with great delicacy by different chemists, but unfortunately without any practical results as regards their application. Many of these, however, are still very interesting subjects of inquiry; as, for example, the respiration, and to examine the change which the air produces upon the blood, which properly belongs more to the physiologist than the chemist; but in consequence of the numerous experiments which have been made upon a variety of secreted fluids, we could not pass the subject over entirely. These investigations were commenced some time ago by Hales and Priestley, and have been repeated by Sir H. Davy, Drs. Bostock, Prout, Wollaston, and others of the present day. It was imagined that these investigations on respiration and secretion would have thrown some light upon the nature of diseases; and it was supposed that the analysis of the blood in the healthy and diseased state would point out many important facts for the better treatment of diseases; but, as I have told you, this unfortunately is not the case, for there are so many impediments in the way of an accurate analysis of animal products as to baffle all inquiries of this kind. With the chemical history of animal products we shall conclude the course; and the geological lectures which were formerly given at its close, will be mixed up with the history of the metals instead of considering them apart; because to enter upon geology with success would require more time than we can devote to it. We were obliged to reduce the subject to two lectures, and therefore it was imperfectly discussed, so that we shall in the present course offer you some geological remarks when considering the metals.

We have been frequently asked what part of the course is to be set apart to analytical chemistry. The fact is, that the whole of the course may be considered as a development of the principles of this art, and the application of these principles will be obvious from the numerous illustrations brought before you. It is quite impossible to describe to the student in a lecture the arts of manipulation; but you will see them performed, and you will have an opportunity of examining the apparatus for effecting the various analytical and other processes. As to analytical tact, that can only be derived from experience; and having made yourselves acquainted with the nature of bodies, you may acquire by practice that tact which belongs to the analytical chemist. These are all the general remarks I have to make on chemistry, and upon the plan of arrangement adopted in this school. There are one or two other subjects to which I wish to call your attention. During the course I may not be heard, or be perfectly understood on some points, from the pupil not being acquainted with the details brought before him; I have therefore to request that the student will apply to have the subject cleared up to him after the lecture. In the next place I have to enjoin punctuality of attendance; we shall be in our place at nine o'clock, and shall not detain you after ten. The necessity of punctuality in pursuing your studies must be so obvious to you, that I am sure I need only mention it to ensure attention to this point.

On Thursday we shall consider *attraction* generally, more especially in influencing the forms of matter.

Lecture II.

Gentlemen,—In the former Lecture, the powers and properties of matter, as connected with chemical changes, were briefly introduced to you under the titles of homogeneous attraction, heterogeneous attraction, or affinity, heat, and electricity. Now, of course, I need only speak very generally of the subject of attraction, because, during the course, you will have a series of illustrations of the effects of attraction upon bodies exhibited to you; so that all I shall do, at present, will be to give a general view of the subject, and to explain some of the terms used in discussing the effects of attraction. As I have before said, we know nothing of the cause of attraction, but that it is a kind of power acting generally upon matter in mass, and upon its ultimate particles. Now, in the former case, it is called *gravitation*, and acts not only at sensible, but also at insensible distances; it controls the heavenly and planetary bodies—and, according to the theory of Newton, were it not for the action of a power called *inertia*, which tends to hold bodies in a state in which they are put, gravitation would cause the heavenly bodies to run together, and form one mass. Gravitation is, therefore, restrained by inertia; whilst that kind of attraction which acts upon the proximate particles of matter, hold-

ing them in contact, is called *aggregation*, which power is opposed by heat and electrical agencies. You will observe, then, that the phenomena of nature depend on two great counteracting causes, the one acting in one direction, and the other in another; the result being that harmony of action which nature everywhere presents. When attraction acts upon the proximate particles of matter, it is to be considered as modifying the texture and form of bodies, it gives a spherical figure to fluids, it tends to the adhesion or cohesion of surfaces, and when it acts on dissimilar particles of matter, that is, when it acts upon the ultimate elements properly so called, causing them to combine or unite, it constitutes chemical attraction, or *chemical affinity*.

The term aggregation is applied to all those cases in which solid bodies are formed, and we say that the particles of this silicious earth (showing a piece of flint) are held together by aggregation; we say, moreover, that they are held together by a strong power of aggregation, because the body is very hard; but, on the other hand, if I take a piece of chalk, I find the aggregation of its particles comparatively trifling; its particles are easily separated from each other, and yet I have the same body, chemically speaking, but in different states of aggregation. Here is a piece of marble, and here a piece of calcareous spar, (showing them to the class,) bodies of very different degrees of hardness, the particles being held together by various degrees of aggregation, but being, notwithstanding, of one and the same chemical nature. The term *cohesion* is employed to signify that kind of attraction which is exercised upon the surfaces of bodies. If you bring together two polished surfaces you will find a strong tendency to adhere, and the denser the bodies are, the stronger is the cohesion of the surfaces. Now this cohesion is not dependant on the air between the surfaces, as was formerly supposed, since it will take place in vacuo. You generally observe the result of aggregation in producing masses of indefinite form; large masses of matter cohere together, without any apparent order in their arrangement; but, in other cases, you find that the particles have arranged themselves in a regular order, and that this order is a mathematical arrangement constituting a series of forms usually called crystals—the term applied to certain definite forms, which certain bodies are capable of assuming. One thing must be attended to in examining these bodies; it is pretty evident that, at one time, they must have been in a liquid state, a state in which the particles composing them must have enjoyed great freedom of motion. Now we are capable, by artificial processes, of producing crystals; and, in very many instances we are enabled to exhibit bodies in a crystalline form, which Nature does not present to us in that state. On the other hand, nature produces many crystals which art has not hitherto been able to imitate. In order to obtain a body in a crystalline form, we must first give its particles great freedom of motion, and this is done by a process of solution. Accordingly, if I pour water upon a piece of salt, nitre, for example, I find that the water will gradually act upon, and dissolve a portion of, it—or, in other words, the attraction of the water for the particles of the nitre overcomes their attraction for each other, and a portion therefore of nitre is taken up by the water, and combined with it in a state of solution; but, after a time, the attraction of the particles of nitre for each other counterbalances the attraction of the water for them, and the mixture becomes quiescent; the water will no longer take up any of the nitre, it has no longer any solvent power over it. If you now apply heat, which diminishes the attraction of the particles of nitre for each other, you enable the water to take up another portion of nitre, and when that is done, the solution is said to be saturated. The phenomena of solution appear to depend upon the relative attractions of the water for the particles of the salt, which are counteracted by the attractions of the particles of salt for each other, and this attraction of the particles of a body for each other, often proves a great impediment to chemical action; we are often obliged to powder them, in order to act upon them chemically with greater facility. Having, in this way, acted upon the nitre with cold water, I shall obtain a solution which will remain permanent; the particles of nitre will be diffused at particular distances throughout the water, and will have no tendency to unite into a solid form; but if you diminish the quantity of water, you bring the particles of nitre nearer to each other, and you give them a greater aggregating power, or tendency to unite. If you evaporate the water to a certain extent, and allow the solution to cool without being disturbed, the particles of the nitre then attract each other, and they do this according to regular laws, producing crystals of a certain definite form. Now the regularity of the form of these crystals will depend upon a variety of circumstances, but more especially upon the quiescence of the solution. If the solution be agitated during the process of cooling, the crystals will be very irregular, and of no considerable dimensions, because the agitation will prevent the aggregation of the particles of the salt; but if you take pains with the evaporation, if you suffer the water to escape slowly, keep the whole in a quiescent state, and operate upon large quantities of

matter, you will find no difficulty in obtaining crystals in a state of great perfection. (Various specimens of crystallised bodies were shown.) To show you the influence of motion on the fluid during crystallisation, I may adduce the ordinary appearance of sulphate of magnesia, as it is used in pharmacy; you know that the crystals have a fine silky appearance, and it would be very difficult to determine their form; but if you allow the crystallisation of the salt to go on slowly without being disturbed, you may obtain large crystals, and you will find that each crystal is a four-sided prism, terminated by two dihedral summits; and if you obtain a perfect crystal, you will find that the axes of these two summits are opposed to each other. It may perhaps appear curious to you to describe the shape of a crystal, but you will find that such information is very valuable in determining the composition of very many bodies. Now here are crystals of nitre of different sizes, depending upon the degree of attention bestowed in their preparation; and here you see a gigantic crystal has been obtained; and here you have a most perfect specimen of crystallisation, a six-sided prism, with a dihedral summit. In preparing a solution for crystallisation, it is necessary to evaporate it down to a certain point, before crystals will form in it; and when you have arrived at this point, you will find that numerous particles of the salt begin to collect upon the surface of the fluid, and form a sort of layer of salt, which is called a *pellicle*; only indicating that a certain number of the particles of the salt have overcome the attraction of the water, and now begin to unite to each other, a sure indication that you will have a crop of crystals when the liquid cools. There are some substances that you cannot dissolve—as, for example, the metals in their pure state, but then you can melt them; and if you pour out the interior of a melted mass of metal, the interior of the cavity will present a crop of crystals; in this way we can obtain crystals which we do not find in nature; but there are many metals found crystallised in their native state, that we cannot procure at all by art. There is another way in which we often succeed in procuring crystals, which is, in order to give their particles the greatest freedom of motion, they may be converted into a state of vapour; and you have a familiar illustration of this mode of crystallisation in the falling of snow, which presents a regular aggregation of the particles of water previously in a state of vapour. The crystallisation of camphor on the sides of the vessels in which it is kept, is another case of this kind.

When substances have been crystallised in water, they generally retain a great quantity of water as one of their elements, and this has been called the water of crystallisation, and that frequently in a very large quantity. The crystals of the sulphate of soda, for example, contain only 72 parts of the dry sulphate of soda, and 90 of water, making 162, which is the equivalent number of the crystallised salt; and there is one fact worthy of notice, that in the crystals of any one body, there is always the same quantity of water entering into its composition. You observe, therefore, that when you obtain 162 parts by weight of the crystals of sulphate of soda, you have only 72 parts of the dry salt, the remaining 90 parts being water, which will always be found in the same quantity in the same salt. Now, when we wish to export salts, or to place them in as small a space as possible, we avail ourselves of the knowledge of this fact, and drive off the water of crystallisation, well knowing that we can recrystallise the salt whenever we please, by again dissolving it in water. Some substances lose this water of crystallisation very rapidly, on exposure to air, the salt becomes opaque upon its surface, and pulverulent; and such salts are said to *effloresce*: others, again, absorb moisture from the atmosphere, and become liquid; such salts are said to be *deliquescent*; some, again, as nitre, undergo no change on exposure to air, and such are called *permanent* salts.

You will find in crystallising salts contained in aqueous solutions, that they sometimes get a fit of obstinacy, and you cannot get them to assume the crystalline form. I have known this to occur more particularly when operating on a large scale, and from some peculiar circumstances, from some state of the atmosphere, or from some cause or other, to the great loss of time and property of the manufacturer. This difficulty may sometimes be overcome, by throwing some of the same kind of crystals into the solution. You will find that the process of crystallisation is often accelerated, by introducing some solid bodies into the solution; and the makers of sugar candy introduce strings into the saturated solution of sugar, on which the crystals become deposited. A stick is often put into a solution, and the salt separates upon it, and it is in this way that the baskets which you sometimes see are coated with crystals of the sulphate of copper, for the purposes of ornament. Here is a large crystal of citric acid, which has been obtained by putting a horse hair into a solution of the acid; now, if you withdraw the hair when you see that a perfect little crystal has been formed, and then immerse it into a stronger solution, you may succeed in procuring a crystal of considerable magnitude.

Now *light* has a most singular influence

upon the formation of crystals. If you take two solutions of any salt, and set the one aside in a dark room, and expose the other to the light, you will find that the solution exposed to the light will crystallise more perfectly than the other. If you put a basin of salt in a room, and admit the light only through a small aperture, you will find that the crystals run up the basin on the side exposed to the light, and vegetate, as it were, in the basin in a most beautiful manner. So that persons who crystallise salts are often obliged to do it in a free exposure to light. There is another curious effect produced on crystalline solution by the *pressure of the air*, at least this has been said. If you take a solution of a salt of any kind ready to crystallise, put it into a flask and cork it up, you will find that no crystals will form so long as the air's pressure is kept off, but the moment you withdraw the cork crystallisation commences. As you see here (the experiment was shown), during the crystallisation there is a considerable *expansion* of the matter contained in the flask, and a certain quantity of heat is evolved. How the admission of air causes the solution to crystallise we do not know. It has been said that the crystallisation is produced by the air's pressure; but pressure will not do it. It has also been said, that it is occasioned by particles of dust falling upon the solution; but this is not the case. Agitation or percussion will also do it, and cause the particles of the salt to unite, but it does not seem a satisfactory explanation to say, that the admission of the particles of air produces the same effect.

Now, in regard to crystallisation generally, but more especially in regard to the formation of natural crystals, there is a curious fact which has long attracted the attention of chemists and natural philosophers, namely, in regard to what is called the *theory of crystallisation*. Of this subject I can only give you a hasty outline, as it would consume a great deal of time to go into all the details. However, I shall devote the remainder of this lecture to the giving you a sketch of the theory. Now this subject was first investigated by Romé de Lisle and Haüy. It was observed by Romé de Lisle, that on taking any number of crystals of carbonate of lime of different forms, that they might by careful mechanical division be all reduced to a rhomboid; or if he took a six-sided prism of calcareous spar, he found that all the fragments were of a rhomboidal figure. Haüy pursued these investigations, and succeeded in dissecting a number of crystals, and in arriving at a certain number of primitive forms, as he considered them. Now it happens that many substances have the rhomboid for their primitive form, but then the angles differ in different substances, but still we find in some different substances the rhomboids of the same angles. It has been long known to the cutters of gems, but especially to diamond cutters, that they can only obtain smooth surfaces when the crystals are broken in a given direction; and that if broken in other directions, the fracture is irregular and uneven. Whatever may be the form of the gem in its rough state, they can only cut it down into the regular octohedron. Now the case is the same with calcareous spar, and one may perhaps render it more evident with a prism of this kind (showing a wooden model of a six-sided prism). Now if we were to proceed carefully to the dissection of such a prism with gentle strokes of a hammer, we should find that only three of the solid angles would yield at one extremity, and that at the opposite extremity the opposite angles would yield, and that alternately.

Now these angles always have regular surfaces yielding planes, turning toward the primitive form of the crystal, generally at angles of 45°. If we go on breaking away, one angle after another, we shall come to this figure, which you see is again the shape of the original prism; continuing the dissection of the crystal we arrive at the rhomboidal figure, which is incapable of affording any other rhomboids. We thus arrive at the primitive form of the calcareous spar, which is always a rhomboid, having obtuse angles of 105°. 5 m., and you will find that each fragment you have removed presents some compound of the rhomboidal form. It is an object of some importance with mineralogists to be able to determine the angles of the different crystals, since, as it has been before observed, several crystals present the same primitive form with different angles. For the purpose of measuring these angles accurately, instruments called *goniometers* are used, and of these there are two kinds. The simplest consists of a semicircular scale of degrees, and a small pair of compasses destined to receive the crystal, one leg of which serves as a radius by which the number of degrees is to be read off upon the scale. The best, however, is that invented by Dr. Wollaston, in which a ray of light reflected from the surface of the crystal is employed as a radius, instead of the surface itself; it enables us to determine the angles of even minute crystals with great accuracy, and is called the reflective goniometer. But as happens in many departments of science, some one discovers some fact that appears to vitiate all our former conclusions, so it has happened here; and accordingly Mr. Mitscherlich has found that heat interferes very much with the accuracy of the measurement, by causing the particles of the crystal

not to expand equally. Now, then, how are we to account for the great variety of secondary forms which these primitive forms produce? Why this I shall endeavour to make you understand, by using two or three familiar illustrations. In following the method just described, Haüy obtained six primitive forms, from which he supposed all the secondary forms were made up. Now let us take the dodecahedron with rhomboidal faces, and see how its formation can be accounted for upon Haüy's theory. He states that the cube is its primitive form, and that if you break it you find all its fragments cubical; but how can we understand how all its angles can be rounded off so as to produce a dodecahedron? Why, Haüy says that the secondary forms are composed of certain decrements of the primitive molecules. He says, that the original cube of the dodecahedron is made up of a great number of smaller cubes, and that if you place a succession of cubes decreasing by regular decrements upon each face of the primitive cube, you will have a series of decreasing layers of cubic particles upon each of its six faces, which will become a dodecahedron if the decrement be upon the edges. But if we substitute for our coarse work the more delicate operations of Nature, you may imagine that it can take place without producing any irregularity in the figures of which we have spoken. Now you can easily imagine how in different shaped crystals the same primitive forms may exist, by recollecting that the decrements may go on regularly upon the edges, and not go on regularly at the angles; and that by irregular, intermediate, and mixed decrements, a great variety of secondary forms would be the result.

We now come to some of the difficulties to which this theory is open. If you take a piece of fluor spar, you will find that it may be broken into acute rhomboidal fragments, and these rhomboidal fragments may be again separated into tetrahedra and octohedra. It becomes a question which is the primitive form of the crystal, the tetrahedron, or the octohedron. Seeing that neither of them can fill space without leaving vacuities, or produce any arrangement sufficiently tenacious to form the basis of a permanent crystal; and it would be an absurdity to say that they were both primitive forms. To get over these and some other difficulties, Dr. Wollaston proposed that the ultimate particles of the crystal should not be considered as composed of geometrical angles as Haüy imagined, but that they should be regarded as being spherical; and he set to work to show us, that all the varieties of the form of crystals might be produced by a certain accumulation of these spheres. This subject was afterwards taken up by Mr. Daniell, and it appears that this hypothesis is better calculated to account for the formation of crystals than that of Haüy. If you press balls of the same size together upon the same plane, you have equilateral triangles produced; and if balls so placed were cemented together, and afterwards broken, the straight lines in which they would separate would form angles of 60° with each other. A single ball placed any where upon this stratum would touch those of the lower balls, and the planes touching their surfaces would include a regular tetrahedron. Then, again, in order to obtain an octohedron, you have only to take four balls and place one upon the centre of each surface, and you get the elements of a four-sided pyramid; you get the elements of the octohedron. It will be, therefore, sufficient to solve the difficulty of the primitive form of the fluor spar to assume, that the ultimate elements of the octohedron and tetrahedron may consist of spherical particles. But to obtain all the varieties of form we are obliged to call in flattened and elongated spheres, or more correctly, oblate and oblong spheroids, to our assistance. Mr. Daniell found that if an amorphous piece of alum be immersed in water, and left to remain quietly to dissolve, that at about the end of three weeks it may be observed to have been unequally acted upon by the fluid, and that the mass will present the forms of octohedra and sections of octohedra, as it were, stamped upon its surface.

Mr. Brande displayed a diagram of the appearance presented by the alum, and concluded by observing, that in the next lecture he should take a general view of the results of chemical attraction.

FOREIGN DEPARTMENT.

CHYLE OBSERVED IN THE VEINS OF THE JEJUNUM.

By Professor MAYER, *of Bonn.*[*]

FROM my own observations, as well as those of Magendie and Tiedemann, it has been proved that the veins of the intestinal canal are capable of absorbing the different fluids which it contains: That these veins also take up chyle, is certainly not to be denied, although the fact cannot be easily demonstrated. Every piece of information,

[*] Tiedemann's and Treviranus's Zeitschrift für Physiologie, vol. i. p. 531.

therefore, will be interesting, which confirms the opinion that the veins of the intestines absolutely absorb chyle, in a manner independent of the lymphatic system, or of those lacteals, the mouths of which open into the veins, as has been recently shown by Folmann. The fact did not certainly escape the attention of former anatomists, although their observations on the matter are few. Swammerdam, Falkenberg, Meckel, sen., found chyle in the veins of the intestines, and Menghini, also observed it in the veins of birds; and in modern times Tiedemann * observed in the vena porta white streaks which resembled chyle. Others deny the possibility of the fact. The following case occurred to my notice:—

A robust man, about seventy-nine years of age, died suddenly from a severe attack of asthma, and his body was soon afterwards brought to the anatomical theatre at Bonn. The chest, as well as pericardium, contained a great quantity of serum. The lungs strongly adhered to the lining membrane of the chest, and contained several tubercles and small abscesses. The viscera of the abdomen presented no diseased appearance. The upper and lower extremities were both anasarcous. The intestines were now removed from the body for the purposes of anatomical demonstration. On examining separate parts of the intestine with care, I observed both on the outer and inner surfaces of the small intestines, vessels of a greyish white colour. At first I took these vessels for lymphatics, but on a closer inspection, found that they were veins. The lower third of the duodenum, the whole jejunum, and a part of the ileum, were covered with these veins, which contained a fluid very similar to chyle; but this fluid only existed on the ramifications of the veins, situated on the surfaces and borders of the intestines; for at the spot where the two layers of the mesentery met, the veins contained blood. On dividing these small veins, a thick greyish fluid, resembling chyle in appearance, was poured out; the small intestines were filled with chyme. No lymphatic vessels containing chyle could be discovered. Unfortunately the other organs were in such a state as to prevent the examination being further prosecuted.

It scarcely admits of doubt that these veins really contained chyle; but it will be asked how the lymphatic vessels of the intestines contained no chyle, although the man appears to have died at the moment when the formation of chyle in the jejunum and duodenum was taking place? This question I am unable to answer, but the appearance which I observed stands recorded. The vitality of the venous probably continued longer than that of the lymphatic system, and that of the right longer than the vitality of the left side of the heart. If this were the case, the systole and diastole of the right continued longer than those of the left cavities of the heart, which might have exerted an influence on the absorption of the chyle, by the extremities of the veins of the intestines.

* Versuche über die Wege auf welchen Substanzen, &c. Heidelberg, 1820, p. 74.

BRAIN OF THE DOLPHIN.

Professor Tiedemann of Heidelberg * has recently published an account of the dissection of the *delphis*. The following are the results of this learned anatomist's investigations:—

1. The cerebellum of the *delphis* resembles that of the simiæ by its size, and next to the cerebrum of the ourang outang, most resembles that of man.

2. Each hemisphere of the cerebrum, as in man and *simiæ*, consists of three lobes, an anterior, middle, and posterior. The hemispheres are undoubtedly much smaller than those in man, since they do not completely cover the cerebellum.

3. The breadth of the cerebrum of the *delphis* exceeds its length, which is scarcely the case with any other mammalia.

4. The convolutions of the cerebrum of the *delphis* are more numerous than in any other animal, even that in man.

5. The lateral ventricles consist in the *delphis*, as in *man* and *simiæ*, of three horns, whilst in other mammalia the anterior and middle cornua only exist.

6. The *corpora albicantia* in the cerebrum of the *delphis*, as of most mammalia, are united into one mass. In man and the *ourang outang* they are perfectly distinct.

7. The fornix, septum lucidum, cornua ammonis, and corpora striata, are in proportion to the size of the cerebrum of the *delphis*, and smaller than the same parts in man.

8. The corpora quadrigemina in the *delphis*, as in other mammalia, are much larger than these bodies in man.

9. The cerebellum of the *delphis* is distinguished by being much larger than in man; and its middle portion, as in *seals* and several other animals, is not symmetrical.

10. The medulla oblongata of the *delphis* possesses no trapezium.

11. The brain of the *delphis* is particularly distinguished from that of man, and all other mammalia, by the absence of the olfactory nerves. But on the whole, the brain of the *delphis* is developed in a greater degree than in any other mammalia, if we except that of the *ourang outang*.

* Treviranus's and Tiedemann's Zeitschrift für Physiologie, vol. ii. p. 269.

DISCOVERY OF A CIRCULATION IN INSECTS.

The following account of circulation in insects, is taken from Professor Carus's Zootomy, a well executed translation of which work has just appeared by Mr. Gore of Bath:—

Professor Carus's observations were first made upon the larva of the *agrion puella*, which swims with great velocity by means of three vertical laminæ attached to the caudal extremity, and diverging from each other at very acute angles. In the young larva, there is no trace of any wings; but as it advances in age, rudiments of wings make their appearance over the rings of the thorax, and gradually increase to their full size, whilst the caudal laminæ, on the contrary, in the same proportion, fade away, and are partially or completely detached. Each of the caudal laminæ, in its natural vertical position, presents an inferior abdominal, and a superior dorsal, edge, has two tracheal trunks running along its centre, and ramifying through it, and consists of granular substance contained between two strata of the external integuments. A current of blood globules enters each caudal lamina, somewhat nearer to the dorsal than the abdominal margin of the lamina. The path or channel thus formed in the midst of the granular substance is perfectly transparent, except where it is occupied by the blood-globules, or crossed by branches of the trachea. The parietes of the channel are not strictly defined, nor formed by anything like the coats of a vessel, the blood, with its globules, circulating through the granular parenchyma, a circumstance, however, which is not peculiar to this case, but also occurs generally in the first states of the circulation, as it presents itself, for instance, in the embryo of fishes, and in the figura venosa of the incubated egg. The blood-globules are elongated like a grain of wheat, considerably larger than those of the human blood, and float in a fluid, which is invisible on account of its transparency, but the existence of which is proved by the variations in the position of the globules in the current, sometimes following its direction, at others crossing it transversely, or more or less obliquely.

When the animal is vigorous, this current is unclosing and uninterrupted, although its velocity is accelerated at regular intervals, and that not only in the abdominal or excurrent, (arterial,) but also in the dorsal or recurrent, (venous,) part of its course through the laminæ. When the animal becomes exhausted, or the caudal laminæ excoriated, the circulation through them is uninterrupted, and, in the same manner, as under the same circumstances in the larvæ of frogs and salamanders, the disturbance displays itself not merely by a cessation of the process, but also by retrograde movements of the currents, or by oscillatory motions of the blood-globules.

In proportion as the wings are developed, the circulation in the caudal laminæ diminishes, and ultimately ceases, preparatory to the detachment of the laminæ themselves. At the same time, however, the circulation presents itself under a new form in the wings themselves. These organs consist of two layers of the integuments, including between them a collection of granular substance divided like net-work into little islands, by the intersection of transparent canals, the largest of the canals taking its course round the margin of the wing, and the whole organ being interspersed with minute tracheæ. These canals present a circulation similar to that in the caudal laminæ, the excurrent (arterial) stream taking its course along the inner margin of the wing, and the recurrent (venous) returning along the outer—whilst, occasionally, other transverse currents take their course through the net-work of the wing, from its inner to its outer margin. As the wings are further developed, the circulation in them, like that in the caudal laminæ, gradually becomes weaker, and ultimately ceases.

The aquatic larva of the ephemer a *vulgata*, according to M. Carus, presents the phenomena of the circulation with still greater distinctness than the preceding animals, and even more clearly than it is possible to recognise it in the larva of frogs and salamanders. In it the circulation is at once visible (with the microscope) in the three last segments of the body, but by a little attention is discoverable, not only in the three terminated spiculæ, and in the upper phalanges of the legs, but also in the head, and particularly in the roots of the antennæ. In the posterior part of the body, there are on each side two currents of blood, not bounded by any regular parietes like those of vessels situated on each side of the intestinal canal, and rather towards the abdominal surface of the animal: of these two streams on each side, the outer is the smallest, and the inner the most considerable. The external one resembles the lateral current in the larvæ already described, and communicates with the internal by several intermediate branches: it is probable from this one too, that the lateral streams are detached in the form of loops into the upper phalanges of the legs, though it is not possible precisely to ascertain this point, nor even whether the two lateral currents on each side continue distinct in the thorax, which it is most probable that they do, as the current in the upper phalanges of the legs is of the same size as the external of the two which

appear in the posterior part of the body, from which the internal differs by its greater size. At the ninth abdominal segment of the body, these two lateral currents on each side, which flow posteriorly from the head towards the caudal extremity of the body, change their direction, and are inflected so as to enter the pulsating heart, from which the current of blood is again impelled towards the head. Before the lateral currents enter the heart, they give off three streams, one for each of the three caudal apiculæ, running through the greater part of the length of each apicula, and being then suddenly reflected towards the heart. It is not possible to ascertain precisely from which of the two lateral currents of the body these caudal streams are detached, though, most probably, from the external; that they come direct from the heart is improbable, as the excurrent (arterial) division of each (caudal) stream corresponds to the abdominal surface of the apicula, and the recurrent (venous) to the dorsal, the heart being situated on the dorsal, and the lateral currents on the abdominal aspect of the body. The currents in these caudal apiculæ present the phenomena of the circulation with peculiar distinctness, and are particularly remarkable from the circumstance that the excurrent and returning streams, though in close approximation, and not separated in any visible manner, continue to flow without disturbing each other. The excurrent stream is accelerated at regular intervals, corresponding to the pulsations of the heart; the recurrent, on the contrary, being always somewhat more sluggish, and the first to stagnate and cease, when the strength of the animal is impaired.

When the extremity of one of the caudal apiculæ is cut through, the blood globules are expelled in some quantity with an evident jet, and accumulate on the injured surface, where, when they are dried up by exposure to the atmosphere, they change their natural limpidity for an evident apple-green colour.

It has been already mentioned, that the heart propels its contents through the anterior part of the dorsal vessel towards its head; the current, however, in the thorax, and in the upper part of the head, is concealed by the opacity of the horny segments of the cutaneous skeleton, and by the contents of the stomach. In the anterior part of the head, however, we can discover currents in the roots of the antennæ, forming loops like those in the legs, the current in each proceeding from the cranial surface of the head, and in returning through the root of the antennæ, taking its course towards the laryngeal region. Nay, by means of the direct light of the sun thrown on the object, an indistinctly defined, but very evidently existing, current may be traced forwards through the thorax and over the upper part of the head, and may be seen to be reflected towards the posterior part of the body in the laryngeal region. Hence, consequently, this larva presents the first instance in which it was possible to trace a true and perfect circulation through the whole body.

The endeavours of M. Carus to discover any evidence of a circulation in fully developed insects, *e. g.*, house-flies, gnats, ephemeræ, &c., were without success until a very recent period (May, 1827). On examining the wings of the semblis *viridis*, immediately after its metamorphosis from the larva state, he discovered the circulation through all the vessels of the wings with the utmost possible distinctness. The wings were still soft, but perfectly developed for flight; the circulation was still visible, though in a less vigorous state, two days afterwards, when the animal died. Still more recently he has observed currents of blood in the larvæ of water-beetles, (hydrephilus and dyticus,) and adds, from a notice by A. V. Humboldt of the travels of Ehrenberg and Hemprich, (in Africa?) that those naturalists have also observed similar currents in the wings of a maubis. Hence it follows, that even at this early period of the discovery, a circulation has been detected in four orders of insects, viz., neuroptera, coleoptera, diptera, and orthoptera, a circumstance that affords the strongest excitement to further investigation in other insects, and under various circumstances.

Of the objects and character of this circulation little can at present be said; its existence, however, in the rudiments of wings tends, in a very remarkable and unexpected manner, to confirm the idea deduced by Oken from analogical considerations, viz., that the wings of insects are exsiccated gills. As regards the cessation of circulation in the perfect insect, or rather its limitation to the dorsal vessel, M. Carus endeavours to show that, though an extreme instance, there are analogous cases, in which, though of less extent, a circulation that once existed no longer presents itself in the fully developed state. Thus, the medulla contained in the cavities of the bones of young birds disappears as they advance to full development, and with it the vessels by which it was supported. Such, also, is the case with their feathers, which, in the early periods of their formation, are exceedingly vascular, and thus, probably, connected with the respiratory function. So, also, in the fœtus of mammalia, the allantoid circulation disappears, and its vessels are obliterated in proportion to the development of pulmonary respiration. The fact that the currents of fluids in the larvæ of insects are not defined by vascular parietes, enables us

to comprehend the rapidity and facility with which the traces of the circulation are lost in the perfect insect. On the other hand, the existence of a circulation at one period, and its cessation at another, elucidate many circumstances connected with the physiology of these animals; for instance, the contrast between the rapid growth and transformation of the larva, and the stationary existence of the perfect insect; the inconsiderable size to which the body attains in this, as compared with other classes of animals; the frequently very short duration of the existence of the perfect insect, in proportion to the prolonged periods of its larva state; its almost total independence of nutrition; and the absence of the power of reproducing parts that have been lost or destroyed.

It still remains to determine at what period of development the phenomena of the circulation first present themselves; to observe more precisely its occurrence in other orders and species, particularly those where the larva is not aquatic, and where, perhaps, it exists only in the ovum; to fix the period and manner of the cessation of the currents of blood, and to distinguish, on the one hand, the cases where the circulation may be supposed to cease, even in the larva state, or, on the other, to continue in the perfect insect.

Lastly, it may be remarked, that the phenomena of this circulation, so far at least as it has been traced, do not throw any light on the obscure subject of the mode of nutrition in perfect insects, which, therefore, must still be supposed to be effected, according to the idea of Cuvier, without the intermedium of vessels. On the other hand, the demonstration of the original existence and subsequent cessation of a circulation, renders more than ever untenable the hypothesis lately suggested by Dr. Kidd, (Phil. Trans. 1826,) that the tracheæ, already recognised as respiratory organs, are, at the same time, employed in the conveyance of nutritive fluids.

ROYAL INFIRMARY, EDINBURGH.

DR. BALLINGALL'S CLINICAL LECTURE.

Considering myself accessory in some measure to the birth of this foundling of the lecture room, I am bound by the natural law of parentage to take it under my especial protection, and endeavour to correct its puerile delinquencies. Though it ungratefully disclaims me as the remote cause of its existence, it betrays in every feature the source of its descent: for, however ingeniously it may attempt to screen its pedigree, it is certain, at least, that until my fertilising spirit breathed on the sterile scene of its nativity, that institution evinced no symptoms of literary parturiency. I am not, however, in the slightest degree offended by such an irreverent disavowal of its origin, as it does my creative powers but little honour; and leaving its ostensible parent to enjoy the alternative of certain unwedded dames, who conceal their frailties under the plea of spontaneous conception, I shall discuss its pettish foibles with the indulgence due from paternal affection to a wayward offspring. But a better reason than the unprofitable vanity of substantiating my claims to its indirect production, or the petty gratification of chastising its author, induces me to examine its lineaments, the circumstances by which its appearance has been attended, and the former state of apathy of the party from which it emanates, with their present efforts to give an air of sincerity to their hollow policy. The writer obviously belongs to that classical school of medical literature, founded by Surgeon Johnstone, &c.; he composes much in the same style of attic elegance, uses the same simple and perspicuous system of logic, and labours for a similar object with a laudable congeniality of principles. Every sentence, indeed, uttered by this liberal and enlightened academy, on being compelled into something like a performance of their duties, is of value as an historical evidence of their former supineness; and every apology made for their neglect, may amuse, if not instruct us, as specimens of the amazing ingenuity of the human mind. They would now have the world to believe, since hospital reports have been made fashionable, that they never as much as received a hint on the subject from a different quarter. To acknowledge an omission, is beyond the reach of their magnanimity; and they consequently prefer the honour of being detected in the act of plagiarism, to the pleasure of being applauded as rivals and imitators of an original and invaluable innovation in medical literature. In submitting to the public the samples of their hospital industry, they imagine that by concealing the name, they injure the inventor, and give to their own conduct the merit of voluntary exertion. It affords the grieved spirit of these grown-up children a melancholy pleasure to hide their motives from view, thinking, no doubt, like the scared infant, when it buries its face in its nurse's bosom, that all is secure when they fold up the secret springs of action in the silence and darkness of wounded self-love. Before the predecessor of the present production appeared, not one Number of the Johnstonian

appear in the posterior part of the body, from which the internal differs by its greater size. At the ninth abdominal segment of the body, these two lateral currents on each side, which flow posteriorly from the head towards the caudal extremity of the body, change their direction, and are inflected so as to enter the pulsating heart, from which the current of blood is again impelled towards the head. Before the lateral currents enter the heart, they give off three streams, one for each of the three caudal spiculæ, running through the greater part of the length of each spicula, and being then suddenly reflected towards the heart. It is not possible to ascertain precisely from which of the two lateral currents of the body these caudal streams are detached, though, most probably, from the external; that they come direct from the heart is improbable, as the excurrent (arterial) division of each (caudal) stream correspondo to the abdominal surface of the spicula, and the recurrent (venous) to the dorsal, the heart being situated on the dorsal, and the lateral currents on the abdominal aspect of the body. The currents in these caudal spiculæ present the phenomena of the circulation with peculiar distinctness, and are particularly remarkable from the circumstance that the excurrent and returning streams, though in close approximation, and not separated in any visible manner, continue to flow without disturbing each other. The excurrent stream is accelerated at regular intervals, corresponding to the pulsations of the heart; the recurrent, on the contrary, being always somewhat more sluggish, and the first to stagnate and cease, when the strength of the animal is impaired.

When the extremity of one of the caudal spiculæ is cut through, the blood globules are expelled in some quantity with an evident jet, and accumulate on the injured surface, where, when they are dried up by exposure to the atmosphere, they change their natural limpidity for an evident apple-green colour.

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ROYAL INFIRMARY, EDINBURGH.

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press ever thought of demanding such contributions as a right from the wards of the Infirmary; but now that such productions have appeared, the stench of servile adulation ascends to their author from every quarter. Believing, or feigning to believe, these empty ebullitions of flattery, he shapes his address in conformity with the applause of Drs. Johnstone, Craigie, and Macleod, who cannot of course do less than believe him in turn, according to the established usage of the old Scottish amusement of "Caw me, caw thee." Thus the "summary which he gave at the conclusion of the last course of clinical lectures, was so favourably received by the pupils, that he feels encouraged to undertake a similar review of some of the cases which have fallen under their observation during the course which he is now about to close." *Fortuna favit fortibus* would seem to be the chivalrous motto which inspired this dauntless introduction; for even an ordinary adventurer in fiction would have reined his steed on the brink of so broad an affirmation. Probably the learned doctor's long attachment to the camp may have betrayed him into the error of transferring the tactics of the art of war into the peaceful pursuits of rhetoric; and that as the case was desperate, he might take his reader's conviction by storm. But notwithstanding this impetuous assault on their credulity, he wishes very humanely "to impress them with the importance of comprehensive views of hospital practice, convinced that it is by these the practice of such establishments must be regulated and improved, rather than by the publication of isolated cases, whether successful or otherwise;" and to mark his own impression of the importance of such an undertaking, he ushers in his own accomplishment of this laudable design, by assuring the world that "circumstances have prevented him from completing such a comprehensive view with sufficient accuracy to lay it before the public." By this very consistent apology, we are shrewdly given to understand, that "isolated cases" are most pernicious food for the mind, when published by unauthorised persons; but when printed by the Doctor himself, are most wholesome and salutary nutriment for pupils and practitioners; since his own, notwithstanding the anathems pronounced against the practice, are but "isolated cases," circumstances having unfortunately prevented him from completing a comprehensive view. The panegyric on hospital reports appears, indeed, but another military stratagem of the Doctor's to batter down "isolated cases" from a moral elevation; but he unwarily exposes his positions to the destructive fire of his own artillery. If it were not for these confounded "isolated cases," we should never, in all probability, have heard one word in praise of "comprehensive views;" and the world would have known as little of the proceedings within the walls of the Royal Infirmary, as it does of the occurrences in the haram of the grand Sultan. But then "much has been recently done in this country in the way of publishing hospital reports; but to give them all the utility of which they are susceptible, such publications should be undertaken on a more systematic, extended, and unreserved plan; so that the results of different hospitals may become fair objects of comparison, and that where different results are exhibited, the profession may be enabled to judge whether *this is* attributable to a difference in the size, situation, construction, and interior economy of the hospitals, to a difference in the class of patients admitted, or to any peculiarities of medical or surgical treatment which may be adopted in them." The doctor is still his own centre, to which all his arguments converge, seeming more anxious about the petty vanity of appearing as successful as his contemporaries, than about realising the real objects of reporting hospital practice. The whole indeed, of this singular introduction, is so obviously levelled at this Journal, and is so impotently malicious in its tendency and execution, that it scarcely deserves further consideration. The impression on the writer was, evidently, that the utility of hospital reports was now incontrovertibly established, and that their future publication could not be prevented; but as he could not deny the one, or avert the other, the only expedient left was to follow the current of popular opinion, and to make it subservient to his own views. We cannot, says he, in other words, deny the principle or obviate the practice, but we may affect to praise the one and execute the other, so that our proceedings may at least appear in a dress of our own manufacture. He might as well, indeed, at once have told his pupils that the sun is a most obnoxious orb; that it offends the eye by its brilliancy, and rivals all objects indiscriminately in its universal effulgence; but as we cannot dispute the general usefulness of light, or suppress its illumination, we can only light a little rival lamp of our own, whose rays we can colour at pleasure, and direct on those objects only which we wish should be made visible to the public. If to this sagacious design he had added a proposition for raising a wall on the border to shade the north from the odious beams of the southern luminary, the wisdom of the speculation would have been complete.

SCOTUS.

Edinburgh, Oct. 12, 1827.

GUY'S MEDICAL SOCIETY.

Saturday, October 13th.

Dr. Bright, President.

The discussion arising from Dr. Hodgkin's paper on Medical Education was resumed this evening, and in consequence of the publicity given to the proceedings of a former evening, with an intimation of the subject being renewed, the theatre was crowded to excess. Indeed it was matter of common remark, that for several years past such a numerous assemblage had not taken place—affording one of the best proofs of the advantage resulting from a publication of the Society's transactions, as well as of the intensity of feeling, happily now awakened, on the subject of Medical Education.

In our last account of the discussion, it was remarked that Dr. Hodgkin had dwelt upon the importance of the anatomy of the respective tissues of the body, being more fully taught than it is at present by the anatomical teachers of London. These remarks in the second reading of the paper called up

Dr. Whiting, who contended that it was an unnecessary expenditure of the student's limited time, to learn the minute anatomy of vessels and nerves; he thought that general anatomy was sufficient for all practical purposes.

Mr. Dodd (one of the Demonstrators of Guy's) spoke of the "lamentable state of ignorance" shown by the major part of those embarked in the practice of the medical profession. He imputed this to a want of time being allotted to the medical student, in the acquirement of necessary information. Such, he said, were the multiplicity of subjects to which the student was required to give attention, and within such a very narrow limit of time, that he knew many were not merely perplexed, but literally borne down by a contemplation of the labour. He regretted that the love of science prevailed so little, that the medical profession in this country should be degraded into a mere "money-getting trade." He thought an extension of time to the medical student was highly desirable, but he considered that something should be done by the corporate medical bodies, to excite a spirit of emulation by the distribution of prizes.

Dr. Rees spoke to Dr. Whiting's opinion, that general anatomy was sufficient to the medical student. Dr. Rees mentioned a case of hernia, in which Mr. Chandler was the operator, Mr. Cline, senior, being present; in the progress of the operation, it became a question, whether the tumour which was exposed was the intestine itself, or whether it was the hernial sac. Mr. Cline was referred to, and he gave his opinion that the part exposed was the hernial sac, and for this reason: the blood-vessels could be seen passing in a longitudinal direction, whilst in the intestine they took a circular course. Dr. Rees said, that he mentioned this fact in confutation of Dr. Whiting's opinion, that a knowledge of the distribution of minute vessels was unnecessary.

Mr. Hardy, senior, expressed his opinion that a *complete* knowledge of anatomy was requisite to the medical student. He should not wish to have it said of the anatomical knowledge of the English student, as had been said of the learning acquired at the Scotch Universities, that "Every man got a mouthful, but none got a bellyful."

A Gentleman, whose name we could not ascertain, but who described himself as a Borough student, made some very pertinent observations on the want of attention to the studies of a young man during his apprenticeship, previous to his arrival in London; also upon the inefficient manner in which the surgeons performed their clinical duties. He said, that he had been through the hospital, with some of the surgeons, and they had scarcely spoken a word in going round; he hoped that the students would not forget that they had paid their money for a certain consideration, which if they did not receive, they would meet as gentlemen, and temperately remonstrate with the surgeons.

Mr. Lambert said, that he had attentively listened not only to the speeches of this evening, but also to those delivered at the last meeting; and referring to these he thought he was right in concluding that an evil existed, viz. that medical education in this country was exceedingly defective; but although the evil had been thus universally acknowledged and deplored, yet he had heard no adequate means proposed for its removal. Dr. Hodgkin had drawn a painful, but still as he (Mr. Lambert) believed, a faithful contrast between the acquirements of the French and English medical student; but to what *cause* was the superiority of the French student attributable? He believed, to the circumstance of an *efficient test*, of the student's abilities and attention, being established in France, *whilst in England no efficient test existed*. He would compare the course of medical studies prescribed to the French student with those required in this country. In France, a good preliminary education was ensured by the student being compelled to

transpiration copious. Mr. Vincent, who saw the case, in conjunction with Mr. Earle, regarded it as serous effusion into the cellular texture of the scrotum, resulting from local irritation, probably induced by the friction of the patient's clothes during his three days journey in the hot weather. Mr. Earle coincided in opinion with his colleague Mr. Vincent; and as a means to relieve the tension of the part, Mr. Earle made a longitudinal incision through the whole length of the anterior part of the enlarged scrotum, on either side the septum scroti. There was but slight bleeding from the divided vessels. The part to be constantly fomented during the remainder of the day, and at night enveloped in a large bread and water poultice. A dose of calomel and jalap to be taken immediately, and the saline mixture, with sulphate of magnesia, every six hours. On the following day the scrotum was reduced about one-third in size, and was less irritable and inflamed. He had passed a tolerably easy night; his bowels had been freely opened, and the febrile excitement was diminished. To continue the poultice and the saline medicine three times a day. We attentively observed the case to its termination. The bulk of the scrotum daily diminished; he lost all febrile excitement in less than a week. The cicatrization of the incisions, though slow, was progressive; and about a month from his admission into the Hospital he was discharged cured.

EXTENSIVE FRACTURE OF THE BONES OF THE PELVIS AND INFERIOR EXTREMITIES.

E. W., an elderly man, about sixty-five years of age, was brought to the hospital, late in the evening, on the 5th, in consequence of a brewer's dray having passed over him. We were informed, that about twenty minutes previously, as he was proceeding along Shoe-lane, in company with his paramour (an old woman, evidently on the wrong side of sixty,) his foot slipped from off the curb stone, when he was precipitated on the pavement, right a head of the dray, which instantly passed over him. He was taken up, and immediately conveyed to the hospital. There is an inversion of the left foot, with evident fracture of the right thigh, the bones riding on each other. Proceeding carefully to examine the different bones, it was observed, that on attempting to rotate the left leg, it suddenly regained its natural position, accompanied with a noise as if a bone had slid into its socket. The hand being placed on the great trochanter, a crepitus was communicated to it, on the limb being rotated, indicating fracture at its basis. The fibula of the same leg was fractured about its lower third; there was a severe contusion on the right ancle, but no fracture or displacement; the fracture of the right femur was oblique, about three inches from the condyles: the whole of the inferior extremities were severely bruised, but no other fractures were detected. The man was placed in one of Mr. Earle's beds, and the fracture of the right femur carefully secured with splints. His answers were vacillating and confused, his pulse small and weak, and the surface of his body much below the natural standard of heat; presently there was an involuntary discharge from his bowels. The house surgeon gave him m. xx. of laudanum, and ordered wine and water to be given at intervals during the night.

On the following morning he was seen by Mr. Vincent. But slight reaction had taken place, the skin had not recovered its natural temperature; pulse small and weak, tongue dry, fæces passed involuntarily; there was that general tremor of the frame, commonly attendant on the latter stages of febrile diseases. Wine and ammonia to be given during the day.

Wednesday. Night passed in a low muttering delirium. Surface of the body rather warmer; pulse somewhat fuller; tongue dry and parched; fæces passed involuntarily. Brandy and ammonia to be given during the day, and a dose of laudanum at night.

10 p. m. Changed for the worse: his countenance is sunken, respiration very laborious, pulse slow and weak, and the surface of his body bedewed with a cold clammy sweat. He continued gradually sinking till about four the following morning, when he expired.

Sectio Cadaveris.

The circumference of the bony rim of the acetabulum was broken off, the fragment retained in its position; the tendinous bands that interlace themselves around the cavity of the joint remaining entire. This will account for the inversion of the left foot, when admitted, and the noise that was subsequently heard on attempting to rotate the limb. The head of the femur must have been thrown just over the brim of the acetabulum; the ligamentum teres was entire, and the probability is that the head of the bone rested on the broken fragment of the ilium, when on attempting to rotate the limb, it slipped into its socket, the fragment of the ilium regaining its natural position. There was fracture at the base of the trochanter, as was imagined; it did not include the whole circumference of the bone. A fracture ran through the body of the os innominatum, so as to divide it into nearly two equal portions; the edges of the bones stood over each other, to the extent of two lines; there was partial dislocation of the sacro-iliac symphysis of the same side; the viscera were uninjured.

HOSPITAL OF SURGERY,

Panton Square, St. James's.

CASES OF CARCINOMA.

We need, we presume, offer no apology for reporting the following cases of Cancer, which, occurring, as they did, together, tended so highly to illustrate the varied forms in which this dreadful disease may be developed.

CASES OF CANCER OF THE MAMMA.

M. B., æt. 65, married. Immediately above the situation of the lower and anterior margin of the great pectoral muscle, there is a large ulcerated excrescence, of a globular form, with ragged and everted edges; the pectoral muscle is much swollen, but this appears to arise from disease in the cellular structure situated below. A chain of large and hard lymphatic glands, leading from the open ulcer to the axilla, is very perceptible, and the connexion between them can be traced without difficulty. The soft parts of the outer and superior portion of the arm are much swollen, and extremely painful, and the glands under the clavicle are also diseased. She suffers excruciating pain, of a lancinating character, in the pectoral region, and more particularly in the arm and shoulder; she is hectic, passes sleepless nights, and experiences much general uneasiness; she has frequent pains in the chest, increased on full inspiration; pulse generally about 100: she is weak, and much emaciated, and her countenance is of a livid colour, and expressive of anxiety and pain. Two years ago a hard painful tumour formed, without any cause, under the nipple, which proceeded gradually to cancerous ulceration. Mr. Wardrop removed the mamma last January, the disease being at that time confined entirely to the breast. The wound healed, except a very small portion, which degenerated into an ulcer; this for several weeks remained stationary, then gradually extended, becoming of a more cancerous aspect, and ultimately assuming its present form, the glands and neighbouring parts being consecutively affected.

This case has run the common course of schirrus and cancer; the healing of the wound, except a very small portion, which became a rapidly extending ulcer, is a common though singular occurrence. The disease having commenced without any exciting cause, may perhaps be considered as one arising from constitutional causes, and therefore not likely to have been permanently cured by the operation.

Case 2.—In the soft parts surrounding the lower part of the right nipple, there is a very deep livid ulceration, about the size of a crown piece, from which there extends a sinus burrowing under the skin, which is in a hard and puckered condition. All the neighbouring integuments, and the whole glands of the breast, are much swollen, and very indurated and knobby, and the upper portion of the arm and shoulder, as in the preceding case, are swelled and singularly painful. No glands in the axilla or under the clavicle, can be found to be enlarged or hard, but the loose cellular membrane, which lies on the serratus muscle, and between the latissimus dorsi and pectoral muscles, has been converted into a thick solid substance. The mammary gland itself is evidently in a very diseased state, and adheres strongly to the ribs, being immoveably fixed. She suffers constant and very severe lancinating pain; her general health is greatly impaired; she is emaciated, has frequent sweats, and her countenance having that peculiar expression which was so observable in the former instance: of late she has been attacked with pain and dyspnœa in the chest, to a severe degree. The disease commenced five years ago, in the form of a hard tumour, situated in the centre of the mammary gland, which appeared soon after the receipt of a blow in that region; this slowly increased, the progress of enlargement being marked with a corresponding augmentation in the puckering of the skin: ulceration at length took place three months ago.

This case, though apparently one of accidental development, and not arising from constitutional disease, is evidently now beyond the reach of operation; although if taken in time, it might probably have been benefited by surgical interference. It appears wonderful that no disease of the axillary glands should have ensued from the long continuance of the cancer, when the cellular membrane had become affected from its continuity.

The severity of the pain in these two cases has been greatly alleviated, and the surrounding inflammation subdued, by the frequent application of a few leeches, and the use of gentle aperient medicines, and of a mild and low diet: no other means have been adopted.

CASE OF CANCER OF THE SKIN.

Mrs. B., ætat. 62. In the integuments of the lower eyelid of the right eye there is an irregularly formed ulcer, extending from the inner canthus, over the orbitar process of the malar bone as far as the temple. The inferior palpebra has nearly disappeared, and the lower and anterior part of the eye-

ball has thus become completely exposed; the superior portion of the malar bone is also bare, and apparently in an unhealthy condition; at the outer angle of the eye the cancerous ulceration has proceeded internally to a considerable depth, thus forming a cavity between the eye-ball and its bony socket; the edges of the sore are very ragged and undermined; the eye itself is sound, but from the destruction of its appendages she is unable to use it. From the whole of this ulceration there is a copious discharge of a thin, acrid, and offensive sanies, frequently mixed with blood. She experiences severe, constant, lancinating pains in the neighbourhood of the disease, and likewise complains of a distressing sense of confusion in the head.

The disease commenced twenty years ago, in the form of a pimple, situated in the skin, at the root of the lower eyelid; this in the course of time became an ulcer, which continued for many years stationary, being generally covered with a scab. Six years since the ulceration began to extend, and has proceeded with great rapidity.—From the advanced age of the patient, and indeed the great extent of the disease, no operation by the knife was practicable, palliative remedies only have been employed. As the general health of the woman is pretty good, and no absorbent glands are diseased, it is probable that she may survive a considerable time.

The following rare case of carcinoma of the mucous membrane of the labium and nympha occurred in Mr. Wardrop's private practice, but we have seen the preparation of the disease, which is now in the Museum of the Hospital:—

——— about 50 years of age, of dark and sallow complexion. The mucous membrane of the right nympha and labium is extensively diseased; it is generally inflamed, and in its centre there is a large irregular-shaped ulcer, extending deep into the cellular structure of the labium, with the mucous lining around it in a very indurated state. The ulceration extends upwards nearly to the clitoris, and backwards to within a short way of the commencement of the vagina; the ulcer continually pours forth a very fœtid and acrimonious discharge, which excoriates the surrounding skin. From this disease she suffers most excruciating pains, which, from their constancy and severity, have rendered life almost insupportable; her nights are passed without sleep, and her general health is rapidly declining. The disease commenced several years ago. Every variety of treatment has been tried without effect.

In this case Mr. Wardrop removed the whole of the labium, and allowed the wound to granulate. This has now nearly healed, and the patient has thus obtained a complete cure.

CASE OF CANCER OF PENIS.

——— ætat. 57, sent to the Hospital by Dr. Titley. In the extremity of his penis, which is now not above two inches and a half in length, there is a deep fungous ulcer, with everted and very ragged edges; the granulations are large and of a florid colour, and appear to be extremely irritable. The ulceration is situated, not only in the corpora cavernosa, but also in the integuments of the penis and spongy body. The orifice of the urethra is very uneven. The disease does not extend far, but is confined entirely to very circumscribed limits, as neither induration nor swelling can be traced beyond the edges of the ulceration. None of the glands in the groin or thigh appear to be in the slightest degree affected.

From this disease he experiences much pain of a lancinating character, extending upwards in the course of the spermatic vessels. The granulations bleed when rubbed or touched incautiously. States that fifteen years ago he had an apoplectic stroke, which was followed by paralysis of the right side of the body, which has continued since, and from the effect of which his intellectual powers have been much blunted; that two years since a small watery excrescence formed on the anterior part of the glans penis, which speedily degenerated into a foul ulcer, which continued gradually to extend, eating away a large portion of the yard till eighteen months ago, when the anterior part of the penis was removed. The wound contracted but never healed, and it was soon after attacked with ulceration in every respect similar to the original disease, which has gradually advanced till it has now nearly reached the root of the penis. As no diseased glands existed in the groin, and as the spermatic chord, testicles, and other contiguous parts, were in a healthy state, Mr. Wardrop thought it advisable to give the poor man the chance of a cure, and accordingly performed the following

Operation.

A piece of wet roller was first applied tightly to the root of the penis, with the view of preventing the retraction of the corpus cavernosum, and Mr. Wardrop then holding the diseased portion in his left hand, and stretching the penis, divided it through at one incision, as near as possible to the pubes. Notwithstanding the application of the firm bandage, we observed that the corpus cavernosum retracted very perceptibly;

no difficulty was, however, found in securing the dorsal artery, that of the corpus cavernosum, and a large branch coming from the septum of the penis, which bled rather profusely. The wound was then dressed in the usual light way, with a simple pledget of lint. Next morning we found that there had been a good deal of hæmorrhage on the previous evening, which had rendered it necessary to tie another small artery; but the patient was entirely free from pain or any constitutional disturbance. The wound now appears to be healing, a circumstance which leads to the confident hope of a complete recovery; but that event, considering the history of the patient, cannot be considered as altogether certain.

This case we conceive to be remarkable on several accounts; first, as showing the recurrence of the cancerous ulceration in a wound of sound parts, and where we have no reason to suppose the constitution at all affected; and secondly, it exhibits another instance of how long open carcinoma can continue, and what ravages it can commit without being absorbed into the system, or attacking the lymphatic vessels or glands even in its vicinity.

CASE OF PARTIAL HYDROCELE.

Immediately previous to the amputation of the penis, Mr. Wardrop punctured a hydrocele, which having rather an unusual history, we are induced to notice. The patient, twenty-two years of age, had, for several years, laboured under a large hydrocele of the left testicle; two years ago, an attempt was made by Mr. Rose, in St. George's Hospital, to cure the disease by the operation of injection—an extremely violent inflammation of the testicle ensued, and the patient, after enduring protracted sufferings, left the hospital with the testis in a swollen state, being informed that when it regained its natural dimensions, a perfect cure would be produced. These hopes, however, proved fallacious, and, in a short time, he found himself in a worse state than ever. Two months ago, he had another *consultation* with Mr. Rose, when that gentleman proposed *pricking* him with the caustic—to this he would by no means agree, being determined not again willingly to undergo the rigors of such *inflammatory* treatment, and, accordingly, soon after presented himself at this Hospital. On examination, the testicle was found to be considerably swollen, and, in the tunica vaginalis, was contained apparently about three ounces of fluid, which afforded a sense of fluctuation. The swelling produced by it was transparent, but it had not the usual pyramidal form of hydrocele, the fluid being apparently confined in two cavities.

Mr. Wardrop, who never in any case performed the radical cure for hydrocele without having, in a previous operation, evacuated the fluid, and examined the state of the gland, opened the tunica vaginalis at its lower part; only two drachms of colourless serum escaped. The nature of the case now became evident. By the severe operation the poor man had formerly undergone, partial adhesions of the tunics of the testicle had taken place, but the vaginal cavity had not been obliterated, and thus, on its re-accumulation, the fluid was confined in several distinct cavities. The remaining portion of the serum, to the amount of an ounce and a half, was discharged two days afterwards by Mr. Duncan.

CLINICAL INSTRUCTION.

To the Editor of THE LANCET.

"Much has been done, but more remains to do;
"Their galleys burn, why not their cities too?"

SIR,—You would be devoid of that noble feeling inherent in man, which results from a consciousness of having done good, could you read the above quotation without your bosom being agitated by the most pleasurable and satisfactory sensations; for without giving you more credit for your labours than is due, I may safely assert, that to no man living are we, as a body, so much indebted as to the Editor of THE LANCET. *Sed hæc hactenus*, as Dr. Blundell says. The Borough Hospitals are now (thanks to your strenuous and unremitting exertions) the best regulated in London; but there still remains an evil in regard to St. Thomas's, which calls loudly for redress. I allude to the practice which all the surgeons here persist in, of going round the wards on the *same day*; thus depriving us of two-thirds of the benefit which ought to accrue from the Institution. The indefatigables may certainly contrive to trot round with Mr. Tyrrell, and afterwards with Mr. Green; but Mr. Travers manages to make his peregrinations (it is said purposely) at two o'clock, when we are all engaged at the anatomical lecture. Now, I cannot believe that Mr. Travers, whose urbanity, splendid attainments, and communicativeness are admitted by all, will intentionally throw an insurmountable obstacle in our way; and I entreat him, in the name of the Borough Students, to make his arrangements compatible with his attendance at the Hospital at a more convenient hour.—Trusting he will not consider it derogatory to his dignity to attend to our request, I remain,

Your obedient humble Servant,

A BOROUGH STUDENT.

Borough, October 14th, 1827.

THE LANCET.

London, Saturday, October 20, 1827.

THERE is no portion of the law of England which reflects deeper disgrace on her legislature, than the parliamentary enactments relating to the government of MAD-HOUSES, and we heartily congratulate the profession and the public on the probability of their speedy repeal. Had those laws been intended to render insanity incurable—to extinguish the liberty of the subject—to furnish instruments wherewith a villain might satiate his revengeful appetite in security—to prevent inquiry into cerebral pathology—to dissipate every rational principle in the treatment—to encourage the cupidity of unprincipled relatives—to place at the disposal of the magistracy a most dangerous and unconstitutional power—to place an equally obnoxious power in the hands of a single medical practitioner—to add incalculably to the horrors of the afflicted—to augment a thousand-fold the exciting causes of the disease—and to render this deplorable malady a valuable article of trade to unprofessional, unprincipled and heartless speculators: they could not have been framed in any manner better calculated to produce such results. In no one respect are those laws founded on sound principles—they are radically, systematically defective. It really would seem that they had been adopted by a portion of that description of persons, for whose benefit they were intended. When the blind lead the blind, we know the result.

The evidence contained in the "Report," published by the select committee appointed by Parliament to inquire into the state of the pauper lunatics in the county of Middlesex, has produced an intense feeling of painful interest. Few were prepared to believe that such atrocious practices existed as are spoken of in that document, although we believe more remains behind the curtain than has been exhibited. Enough, however, has been disclosed to satisfy the public that the establishment of a COUNTY HOSPITAL, for the exclusive reception of INSANE PAUPERS, is imperiously required in the vicinity of the metropolis. The advantages resulting from such an institution, if properly regulated, would be indescribable; and we hope that the magistrates, at their annual meeting, on the 1st of the ensuing month, will show that they are not deaf to the voice of the public and of science, or insensible to the piteous cries of their insane poor.

If such an institution were founded, and thrown open GRATUITOUSLY, to all medical students (a regulation that ought unquestionably to be adopted,) the entire kingdom would, by that means, participate in its benefits, arising from the increased knowledge of her medical practitioners, in by far the most important, though the most uncultivated, of human diseases. It is deplorable to observe, in the report of the committee, the treatment to which the unhappy sufferers are subjected—distracted in mind and tortured in body—chained down naked to beastly cribs, from Saturdays till Mondays, without being once removed, with no other sounds to greet the ear, than the incoherent and horrible yellings of their maniacal companions,—with no other view to meet the eye than the bare walls of a madman's den. Who can contemplate such a scene without feelings of horror! Is it to be expected that *cures* can be effected in such a frightful hole—*cures*, indeed! who are the attendants?—unprofessional idiots, if we have read the evidence correctly—porters, uneducated servants, any one who happens to be in the way. In a word, the patients are not classed, but placed together like a herd of swine. Taken altogether, it is a most infamous system, and casts a deep stain on the humane charac-

ter of the influential people of this country. The public, however, are much indebted to Lord ROBERT SEYMOUR, Mr. ROBERT BROWN, and Mr. GARRETT DILLON, for having, by their indefatigable exertions, succeeded in procuring the appointment of the parliamentary committee, which we can already perceive will be followed by very important results.

We shall return to the subject, and give some extracts from the REPORT.

ONE of our Correspondents, who subscribes himself "A Physician," without assuming any of the designations which distinguish the different classes of belligerents, complains of our inveterate hostility to a department of the profession whose interests, in common with those of every other department, we have uniformly supported; while another Correspondent, under the signature of "A Friend," reproaches us with having praised the conduct of an individual, who has been on many occasions the object of our unsparing censure. The Physician's letter we shall insert, without abridgment; the other communication we do not insert, because, although parts of it are not undeserving of notice, it is not in all respects fit to meet the public eye. The charge of inconsistency is founded upon the circumstance of our having last week mentioned Mr. GREEN as one who had honourably distinguished himself from most other Hospital teachers, by his endeavours to supply the want of a regular system of clinical instruction in St. Thomas's Hospital. "Whence," asks our Correspondent, "this sudden approbation of the conduct of Mr. Green? Whence this change of sentiments with regard to a man whom you have hitherto pursued with unrelenting hostility?" We will answer both these questions; and first, that which is founded upon the supposition of our entertaining a personal hostility to Mr. Green. We entirely disclaim all private feelings of animosity towards that gentleman; whenever we have opposed him, we have opposed him upon public grounds; and if the grounds of our opposition be removed, our hostility must cease with them.

With respect to the cause of our approbation, Mr. GREEN's efforts to introduce something like a system of clinical instruction, in St. Thomas's Hospital, are matters of notoriety; and our attention was last week more particularly attracted to these efforts, by the circumstance of his having offered *two gold medals*, one to be awarded to the student of St. Thomas's Hospital, who should, at the end of the year, produce the best set of *clinical reports*; and another to the student who should produce the best set of *anatomical preparations*. Knowing these facts, we should have ill-deserved that confidence which the readers of this Journal impose on our impartiality, if we had hesitated to except Mr. GREEN from the censure which we have passed on most other hospital teachers, out of resentment for the part which that gentleman has on former occasions taken against ourselves. Of Mr. GREEN's attempts to suppress the publication of hospital reports, and to establish a system of "Hole and Corner surgery" within the walls of St. Thomas's Hospital, our opinions of course remain unaltered; but we will never suffer our opinions of his past errors to influence our judgment when it may be our duty to notice his present or future claims to approbation. We have never quoted individual favour, nor sought to avert individual resentment; our motives and our ends have been strictly identified with the interests of the profession and of the public. It is the honest independence of this Journal which constitutes its real strength; the power which we possess is founded on a legitimate basis—the basis of public opinion; and our enemies, as

well as our friends, may rest assured that the influence which has been fairly and honourably obtained, shall be fairly and honourably exercised. *Amicitiæ sempiternæ, inimicitiæ placabiles*; let our friendships, if possible, be perpetual, but at any rate let our hostilities be open to conciliation. And now for the letter of "A Physician":—

To the Editor of THE LANCET.

"If the contest should terminate like that of the Kilkenny cats, which fought till they left nothing on the field of battle but their respective tails; if, in short, the *pure* "Fellows," the *pure* "Licentiates," the *pure* "Independents," should finish the combat by destroying one another; we know not that the public would have any great cause to regret their annihilation."—LANCET, No. 214. p. 4.

SIR,—Your Journal is too widely circulated, too influential, to suffer such paragraphs as the foregoing to pass unnoticed; and I trust that the spirit of free discussion which animates you, will ensure equal currency to a few comments, by one of that body to which your oblique censure applies.

Whence the hostility to physicians, which this gratuitous slight, this unmitigated reprehension displays? By what misdeeds have they merited such unsparing severity? What offences have been proved against them, to authorise the stigma thus attempted to be cast on them? And what good end is likely to be served by the tone of obloquy and reviling here so wantonly indulged in?

On each of these points I shall offer a few remarks; and I trust that in doing so, I shall not be betrayed by the provocation given, into any departure from that calmness and urbanity, by which controversy, on all subjects of public interests, should ever be characterised. But first I must say a few words on the source whence this condemnation of all physicians emanates.

Your Journal, Sir, addresses the profession, and you not unfrequently claim the merit of protecting its rights and interests. This character gives to your animadversions a power of wounding, which, as the advocate of a party, you could not possess. It becomes necessary then to scrutinise the scope of your guardianship, and to understand the sense in which the term profession is employed by you. I fear, Sir, that you and I use it in a very different sense. I have been accustomed to consider it as a comprehensive term, embracing all the branches by which professional offices are administered: you appear to regard it as confined to that class of practitioners, who are the immediate objects of your favour; as if all others were unworthy of being classed under it. This is no hasty surmise, but a conclusion derived from careful attention to the tenor of your customary remarks. The surgeons you vilify,—the apothecaries you ridicule,—the physicians you consign to annihilation. By whom, then, is the profession to be supported, or of whom are we to consider it as consisting?—None remain save those members of the College of Surgeons, who act as general practitioners. Of this body alone, then, are you the champion, and it is well that this should be understood, in order that such partial advocacy may not mislead. But are we prepared, Sir, to admit this identification? Are the other classes so worthless, as to be wholly excluded the professional pale? Are we all sunk so low as to make no resistance to this overweening pretension? I trust not; and as one individual, I enter my protest against the disfranchisement to which physicians, surgeons, and apothecaries, are thus consigned. To your defence of the surgeon-apothecaries, I have no objection; but I do object to this defence being carried on under the assumed garb of a guardian of the profession.

To return to the points which I profess to discuss.—Whence the hostility to the physicians which the paragraph prefixed to this letter displays? I can conceive no source but that error to which partial advocacy is prone; a belief that by depressing others we elevate ourselves. As the advocate of the general practitioners, it is natural that you should find the physicians in the way, and wish to remove them. I accuse you not, Sir, of any unprincipled desire to get rid of troublesome rivals; and I can in charity believe that you have dwelt so long on the merits of your favourite practitioner, as to be satisfied that he would worthily, and beneficially to the public, replace the physician. This, however, is a point on which happily the public have a voice, and I have little apprehension of their adopting your predilection. I, Sir, shall not imitate your policy by undervaluing the general practitioners; but while I freely admit their merits and usefulness, I venture to express my own conviction, that with all their qualifications they are unfitted to fill the chasm which your contemplated annihilation of the physicians would create.

By what misdeeds have the physicians merited the severity shown? What offences have been proved against them?—To these questions you, Sir, are called on to reply, for as yet you have not supplied us with an answer.

What good end is likely to be answered by assailing the physicians with obloquy and

reviling?—It would be difficult to show while it is easy to trace both the injustice and injury of this vituperative warfare. It is unjust to decry the physicians, without specifying the demerits with which, by implication, they are charged,—to pronounce condemnation without giving them the benefit of fair trial. It is injurious to mar, by indirect blame and insidious sarcasm, the endeavours of any branch of the profession to rescue itself from misrule and oppression. The whole profession needs reform, and requires a legal organisation, which shall leave its several branches free to discharge their respective functions, with advantage to the public, and without collision among each other. The physician's department calls for this more imperatively than any other, because the legal government under which it exists is more antiquated, more inefficient, and the powers conferred by it more signally abused. In seeking redress of grievances most onerous and too long endured, the physicians have enough to contend against, without encountering the enmity of those who ought rather to foster their endeavours. My object, however, Sir, in this address, is not to deprecate your hostility, but to request that if the paragraph which has called forth these remarks be not a hasty and inconsiderate effusion; if it is to be regarded as denoting the feelings which you entertain towards the physicians, and the course which you mean to pursue in your editorial labours, you will manfully declare yourself their enemy, and avow the hostility against which they have to guard. I, Sir, am no rigid censor of casual expressions, uttered inadvertently or under excited feeling. A flippant remark, even though tinctured with malevolence, I could overlook, and freely forgive; but such undisguised and inveterate enmity as your late paragraph evinces, could not be passed over without culpable dereliction of the duty which I owe both to my own department and to the profession.

I have thus given you my sentiments on the subject, in which I trust the whole body of oppressed physicians will participate. I have pointed out an aggression on your part unprovoked, and unsustained by any evidence of delinquency to warrant the indiscriminate condemnation which you pronounce. I leave it to yourself, either to redeem the trespass, or openly to avow an enmity, against which the physicians may be on their guard, and from which they will then know how to defend themselves.

I am, Sir, &c. &c.

A PHYSICIAN.

Oct. 7th, 1827.

We cannot compliment the author on either his "urbanity," or "calmness," and still less on his interpretation of the extract from our preface. In the third paragraph he proceeds to "say a few words on the source whence this condemnation of all physicians emanates," and really we should like to be informed whence this condemnation of ALL physicians is to be found; certainly not in the above quotation. Is not the censure, if worthy of being called such, directed exclusively against the *pure* fellows, licentiates, and independents? yet the author has disingenuously omitted the adjective throughout the whole of his letter. Where then is the censure on ALL physicians—where is the hostility displayed? To condemn ALL physicians, when we know that some of them are the brightest ornaments of the profession, is a notion that we could not have entertained even for a moment; and, on reflection, the writer must perceive that his accusation against us is not only unfounded but ludicrous. Physicians belonging to every party have been treated with great fairness in the pages of this Journal; on no occasion have we refused insertion to their communications, when they were calculated to provoke discussion, or elicit truth. In common charity, we might well be spared a charge of partiality from one of the "Independents," in favour of whose just claims, as regards the college, we have published some two or three scores of letters. Their "circular" also we inserted without comment; a document in the highest degree insulting to the general practitioner. Anxious that every subject connected with medical legislation should be strictly investigated, with a view to learn the best principles of government, we have repeatedly given publicity to opinions directly opposed to our own—the return is a charge of partiality.

If we mistake not, the majority of physicians feel they are on slippery ground—the unadorned title of M.D. has

lost its charms with the public; something more is required than the mere sound of "Doctor," and we are persuaded that physicians, simply as such, will continue to sink in public estimation, until their knowledge of anatomy, pathology, and surgery approximates more nearly to the information possessed on these subjects by the surgeon. With regard to both *pure* physicians and *pure* surgeons, the conceited and empty sticklers for exclusive rights, we heartily despise them. SOLOMON says, "There is a generation that are *pure* in *their own eyes*, and yet are not washed from their *filthiness*." The family, therefore is evidently of ancient origin, and will not be extinct probably for another quarter of a century. We shall return to the subjects referred to in this letter, but fear that the questions will not be answered to the author's satisfaction. It is really surprising that a brace of cats' tails should have caused such a fuss; but as suspicion is confirmation to the jealous, so is fear fatal to the weak; and when men are conscious that their reputation stands upon an unsubstantial basis, they are morbidly alive to every circumstance that threatens to expose the slender materials by which it is supported.

During our long acquaintance with the west end, we have never witnessed the winter campaign open under such gloomy appearances as in the present season, at least for those who were wont to be considered the demi-gods of the profession. The surface of the earth seems entirely changed. The low arts which formerly were practised, *ad captandum vulgus*, have now ceased to have any effect; and those riotous feastings which used to be held, on similar occasions, by the lecturers of a certain ancient school, for the purpose of entrapping the raw victims, have now ceased to be attended by the dupes of avarice. Pupils, as well as patients, have in this quarter of the metropolis become singularly scarce; and the *great dons* are loudly complaining that both their pockets and their benches are empty.

What can these portentous changes mean? Or how can they be accounted for? Why, on very simple grounds: first, the public has been made acquainted with the shameful practices which prevail in the large hospitals, and which have hitherto been employed as mere tools for pushing on the fortunes of their unskilful medical officers;—and secondly, the pupils have at length become convinced that they can neither see the practice of medicine or surgery conducted in those establishmen: nor are there any lecturers connected with them of sufficient talents or acquirements to enable them to instruct the minds of youth. The pupils have, therefore, winged their course to more hospitable shores; and we have been well informed, that a vast proportion of those who a few years ago would have entered at some one of the west end schools, are now to be found busily cultivating their profession in Dublin or Paris; while others have dispersed themselves among the St. Bartholomew's or Borough schools.

The Windmill-street Seminary, which, during the reigns of Hunter, Cruikshank, Wilson, and Bell, enjoyed a high, and, we sincerely believe, a very deserved reputation, is now fast crumbling into decay! We hope that the fall of this vast fortress will teach the rising generation that talents can neither be bought or sold. We strongly suspect that Messrs. Mayo and Brodie will find to their cost, that they have purchased no great bargain from Mr. Bell, who seems to be as expert in the art of selling schools, as he is in the manufacture and trade of "*nece spicimins.*"

The address of Mr. Skey on commencing the Demonstrations at St. Bartholomew's on Tuesday last, will be read with interest. Of the nature of the squabble between Mr. Wormald and Mr. Skey we are uninformed, and therefore shall offer no opinion respecting it. Mr. Skey observes, "Had I obtained from Mr. Abernethy that justice I had a right to demand at his hands, all comment from me here would have been unnecessary." Of course we cannot tell what sort of justice Mr. Skey sought to obtain from Mr. Abernethy, but we are by no means surprised that his application was unsuccessful. Although Mr. Abernethy has again and again assured Mr. Skey that he never spoke of him in a slighting manner, yet Mr. Skey says, "That Mr. Abernethy has spoken of me in terms of disparagement, no one can doubt." We think so too; but Mr. Abernethy tells us, that when he called Mr. Skey a fool, it was merely in allusion to the "comparative opulence of Mr. Wormald's family." Disgraceful shuffling! We are pleased with the manly course adopted by Mr. Skey in coming forward, and speaking up so boldly in his own vindication, and sincerely wish him success.

HOSPITAL OF SURGERY.

A benevolent and generous individual has given, within these few days, One Thousand Five Hundred pounds to the committee of this hospital, towards a fund for erecting a more commodious building. The name of this benefactor is, by his own desire, for the present suppressed. The new hospital will be opened in the neighbourhood of Charing-cross, where the King, with his usual and characteristic munificence, has given a spot of ground on which it is to be erected. A tenth part of the patients who apply for relief, cannot be accommodated at the present establishment.

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TO PAY THE FINE AND LAW EXPENSES OF MR. W. COOKE, OF EXETER.

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Amount already advertised	210	10	0
The Medical Society of Hexham, per their Secretary, Robert Stokoe, Esq.	2	2	0
William Day, Esq., Isleworth	1	0	0
Mr. Bryant Donkin, 80, Great Surrey-street	1	0	0

Outlines of Medico-Chirurgical Science, containing Remarks on Medical Education, and Illustrations of the application of Anatomy, Physiology, and Pathology, to the principal practical points in Medicine and Surgery. With Coloured Plates. By Thomas Turner, M.R.C.S., Lecturer on Anatomy, &c. Second edition, 8vo. pp. 371. Underwoods, London.

The first edition of this work appeared towards the close of 1824, and has met, as we then anticipated, with a favourable reception from the profession. The clear but concise manner in which the human body is described, and the physiological considerations blended with this description, render the first part of the work extremely instructive to those who are commencing their professional career. Whilst the second division of the work, which treats of the relative position of the parts in many regions of the body, and their connexion with the principal practical points in medicine and surgery, can scarcely be less acceptable to those more advanced in their studies, or engaged in active practice. This part of the subject afforded ample ground for the display of professional knowledge. The field was unoccupied; no one in this country had hitherto undertaken to give an account of all the regions of the body, and to point out at the same time the influence which their organisation exercises on the development of disease, as well as their several

relations in connexion with the performance of surgical operations. Parts of the body, as the head and neck, groin, and perineum, have been studied on this plan, but it had not been extended to the consideration of the whole frame. For an undertaking of this kind, a person ought to possess a more than common knowledge of the region which he has to describe, and be able to point out, as by a kind of induction, the influence which the structure of a part is capable of exercising on its diseases. Anatomical knowledge, therefore, alone, is not sufficient for the purpose, it must be combined with an extensive acquaintance with disease, and the power of tracing disease to its cause.

This mode of studying anatomy renders it absolutely necessary to subdivide the body into different parts, each of which must be fully considered before proceeding to another. Mr. Turner divided the body into eleven, viz. the cranium, face, eye, nose, mouth, spine, neck, thorax, abdomen, upper and lower extremities. He first gives the anatomy of the part, and then mentions the principal practical points connected with it. The anatomical description of some of the divisions of the body, fall short of what we expected to find them in this edition. In the neck, for instance, no account whatever is given of the superficial or deep fascia, no mention consequently made of the structures which are enveloped by them, or the various effects which they exercise on the development and treatment of abscesses, and on the important office which the deep fascia performs during the time of inspiration. The fasciæ concerned in inguinal and crural hernia, are, on the contrary, minutely described, and the different kinds of hernia well explained. The anatomy of inguinal hernia is worthy of the student's attentive perusal.

"If an incision be made from about three inches below the umbilicus, to the anterior superior spinous process of the ilium; and another from the commencement of this incision, perpendicularly to the symphysis pubis; we include a portion of integument, under which are the parts concerned in inguinal and crural hernia. To display these parts, another incision in the integument is required, from the centre of the transverse one, directly downwards, to about three inches below the groin; two flaps of skin will thus be formed, and these flaps are to be carefully dissected from the condensed layer of cellular membrane underneath, and reflected, the inner towards the linea alba, and symphysis pubis; the outer towards the spine of the ilium, and the outer part of the thigh. The condensed membrane, which is now seen covering the aponeurosis of the external oblique muscle, Poupart's ligament, the spermatic cord, after emerging from the ring, and the upper part of the thigh, is called the fascia superficialis. It is a structure not confined to the groin; but here, and in other portions of the body, it is thicker, more membranous, and deserving of particular notice, from its relation to hernia, and suppurating buboes.

"The fascia superficialis is to be separated from the aponeurosis which it covers, and reflected in a similar way to the skin; this will expose the glistening tendon, its termination in Poupart's ligament, the upper portion of the fascia lata of the thigh, and the inguinal glands; and the student will easily understand, after observing the situation of the superficial fascia above the inguinal glands, why it is that abscesses in the groin are long in bursting; for the fascia thickens from pressure, and offers great resistance; and why, if allowed to open spontaneously, a sinuous ulcer is often left, which is troublesome to heal. The common skin, and fascia just described, are then the superficial parts of the inguinal region.

"The portion of aponeurosis, which stretches from the superior spinous process of the ilium to the symphysis pubis, is next to be examined. It is called Poupart's ligament; and, at its pubic extremity, there is an opening formed by a separation of the tendinous fibres, and named the external abdominal ring, in contradistinction to another aperture, by and by to be described, which is the internal ring. If the student expected to find the external abdominal ring a distinct opening, he will, in this stage of the dissection, perceive his error. It is occupied by the spermatic cord and cellular membrane, over which is a thin delicate fascia, which is called the fascia of the cord, and conceals the site of the ring; on raising this, and breaking down with the handle of his scalpel the cellular connexions of the cord, he will be able to observe the ring, which, however, is not circular, as its name would seem to imply, but rather of an elliptical form.

"The aponeurosis of the external oblique muscle is now to be detached from the internal oblique, which is under it, and turned towards the thigh. The internal oblique is then to be detached from the transversalis, which is beneath, and these two muscles observed in their relation to the spermatic cord in its passage from the external ring, to its disappearance at the groin. The student is then to replace the internal oblique and transversalis, and to leave the aponeurosis of the external oblique reflected towards the thigh. By taking hold of the spermatic cord, and gently drawing it, he will see its course behind Poupart's ligament; and will observe, that it is covered with a few pale fibres, called the cremaster muscle, which are derived from the oblique internus, and transversalis muscles.

"If now the internal oblique and transversalis be carefully cut, and pushed upwards with the handle of the knife, a thin fascia will be seen lining the posterior surface of the latter muscle; it is the fascia transversalis of Cooper. Below, it is firmly attached to Poupart's ligament, and the pubis; and passing upwards, we find it between the posterior surface of the transversalis, and the peritoneum. In this fascia is the internal abdominal ring, by which the cord leaves the abdomen. The tendons of the internal oblique, and transversalis, are not then perforated for the passage of the cord, for the opening is in the fascia above mentioned, and the tendons of these muscles form, as it were, an arch over the cord. In tracing the cord, the student will observe it, in what is called the inguinal canal, viz.—that space between the two rings; that it is here situated behind the aponeurosis of the external oblique; and that it passes under the edges of the internal oblique, and transversalis muscles. At the internal abdominal ring, (which is not a well defined opening, without breaking down the cellular membrane about it,) the spermatic cord is formed; and behind the ring is the peritoneum, which lines the abdominal cavity; it is important to bear this in mind, as it explains the nature of the hernial sac.

"In the dissection, the student must observe the epigastric artery. It arises from the external iliac, and passes upwards and inwards towards the rectus muscle; it is situated a little on the inner side of the internal ring, and between the fascia transversalis and peritoneum."

The practical observations contained in this work are very instructive, and display, on the part of the author, an extensive knowledge of the subjects which he has handled. The diagrams will be found very useful, particularly that of the peritoneum, which is used by Dr. Monro, of Edinburgh, in his class-room, and in many of the dissecting-rooms of this metropolis.

LECTURES ON COMPARATIVE ANATOMY.

On Thursday last, Mr. John South gave a lecture at Thomas's Hospital, introductory to a course on Comparative Anatomy. It is a fact, although we blush to mention it, that these are the only lectures delivered in London on this most important subject. Viewing comparative anatomy as a study subservient to our physical knowledge of man—as a means whereby the functions or uses of parts are learned, either from the more fully developed or less complex structure of the organs of animals, it is a study of the highest importance to medical students. It might easily be shown, that our present knowledge of many of the most important functions of the human body has been derived from an observance of similar functions in animals; but we need only refer to John Hunter's physiological facts in support of this observation. But even if the desire of an intimate acquaintance with physiology, and thus of consequence, with pathology, were not sufficient incentives to prosecute the study of comparative anatomy, it might be found in the pleasure afforded to a philosophic mind, in the contemplation of the laws of Nature—of observing and tracing the common *vinculum*, by which an almost infinite variety of living beings are held together. Whether we commence our studies with the more perfectly organised animals akin to man, and thus descend the scale, or whether we begin with those beings endued with the lowest share of vitality, and but one degree removed from the vegetable kingdom, there is matter equally for astonishment and admiration—in the zoophyte as well as in man. This study is surely as agreeable, and we may venture to say, as useful, as botany or chemistry; and now that a Zoological Society is established, where an opportunity will be afforded to become practically acquainted even with the more rare animals of the creation, we do hope and expect that an impulse will be given to this most delightful branch of study, that it will form a prominent part in the education of every medical student, and that we shall no longer be compelled to look to foreigners for information on these subjects.

Of Mr. South's merits as a lecturer on

comparative anatomy, we are not fully prepared to speak; we know that he has bestowed much patient investigation and labour in the acquirement of information connected with the subject; and if we may judge from the two lectures already given, and some that we heard last year, we should augur favourably of his capabilities. Perhaps a greater share of *vivacity* in the descriptive department of the course, would render it more attractive.

CLINICAL SURGICAL LECTURES.

Mr. Tyrrell commenced a course of clinical lectures, in the male operating theatre, on Saturday last. In this first or introductory lecture, Mr. Tyrrell confined himself to an explanation of the plan he intended to pursue, directions to the student as to the best method of taking notes, and attending to the surgical practice of the hospital. Mr. Tyrrell avowed his strict determination to preserve order on the occasion of his performing operations; stating that he would invariably refuse to operate until those persons who usually crowded into the ring (appropriated to the surgeons and a few immediate assistants,) had retired to their proper situations. [We are heartily glad to hear this resolution from Mr. Tyrrell, and we have no doubt that he will be fully supported by the majority of the pupils, inasmuch as the persons who crowd into the ring, and intercept a view of the operation, are, for the most part, interlopers,—*hospital jackalls*, et id omne genus. The conduct observed during the performance of operations last season, was as stated in a letter from a Borough Student, and published a fortnight since—"*shameful!*" and we have, on several occasions, in common with many of the students, retired in disgust from the *bear-garden* scene.]

Mr. Tyrrell announced his intention of continuing his Clinical Lectures on Fridays, from twelve to one. Mr. Green purposes to give Clinical Lectures on Saturdays, between the same hours.

THE MEDICAL PROVIDENT INSTITUTION OF SCOTLAND.

The Medical Provident Institution of Scotland held its first annual general meeting, as briefly stated in our last, in the Physicians' Hall, on Friday the 18th inst.—Dr. Moncrieff, chairman, read a Report of the directors, which was unanimously approved; and which, together with the Report laid before the first General Meeting, (also read for the sake of information) detailed the objects, nature, progress, and prospects of the Institution. Thanks were then voted to the Chairman and Directors for their past services—and a new board of management for the ensuing year was formed—Dr. Moncrieff and Dr. Poole being re-elected chairman and deputy chairman. Various letters, from gentlemen at a distance, who could not attend the meeting, expressed satisfaction at the establishment of the Institution, promising it their support, and offering such suggestions for its welfare as circumstances seemed to require.—Such encouragement was gratefully received by the meeting, and drew forth sundry corresponding remarks, especially from Dr. Thatcher, who spoke with much feeling and earnestness. Among other observations, he stated his opinion, that the merits and beneficial tendency of this excellent institution were but very imperfectly understood. He approved much of the Report which had been read, as most favourable on every point. It was true, that much hitherto had not been effected, but let it be remembered that the Society had in truth existed only a very few months. This was owing partly to the difficulties of the times, but more especially to the erroneous impression which existed, that it was an insurance on life, rather than a decided Provident Institution, principally intended to aid the medical practitioner, by the contribution of a very slender proportion of professional income, to receive many future advantages. Under the head of the first Table, the contributor derives, when incapacitated by sickness, or any of the casualties of human nature, an income which would relieve him from dependence on the benevolence of private individuals, or the *sympathy only* of any corporate body to which he might be attached; but by contributing to the society he would obtain a moderate competency as a right, not as a painful boon to his feelings. Under the head of the other Tables, obvious and decided advantages existed. He knew well, and there were, no doubt, many gentlemen present, who at this moment were aware of brother practitioners and their families, who would have been spared much pain and mental anxiety, if there had existed a provident and benevolent fund like this to apply to. He entreated, therefore, that both locally and generally, the value of the Institution should be disseminated by the most active exertions. It required only to be known to be duly appreciated.—*From the "Scotsman" of May* 23, 1827.

DEMONSTRATIONS AT ST. BARTHOLOMEW'S.

It having been announced that Mr. SKEY would begin his *Anatomical Demonstrations* at St. Bartholomew's Hospital on Tuesday morning last, at nine o'clock, considerably before the hour, the theatre was filled in every corner, and on that Gentleman's making his appearance, he was received with long-continued and general applause. We heard a hiss only from one or two individuals. After several attempts to address the pupils, which attempts were rendered nugatory by the plaudits, he at length succeeded in obtaining a hearing, and addressed the class as follows:—

GENTLEMEN,—However strongly disinclined I may feel to introduce any subject in this theatre irrelevant to that which we are assembled to discuss, I should be wasting in self respect, and should betray culpable indifference to public opinion, to my own reputation, as well as to the kind reception I have met this morning, were I to pass without notice or comment imputations published against me by my opponent during the late election of an assistant surgeon to this Hospital. Were I disposed to follow the advice of the more prudent, probably I should, on appearing before you, have made no allusion to the past; but these considerate advisers have neither the power nor the inclination to form a just estimate of the nature and extent of the insult to which my feelings have been subjected.

Explanation is a duty I equally owe to myself and to you, and I shall exercise my own discretion in determining how far I may deem it right to introduce it, uninfluenced by any fear of offending one party, or any desire to gratify another. I have been too long an object of calumny in this place, to withhold from any feeling of delicacy, or to allow the fear of offence to the feelings of those around me, who have evinced especial indifference towards mine, to deter me from the fair avowal of my own sentiments, or the honest defence of my own character; and if Mr. Abernethy and a host of professors were seated before me, I should address to them the same language I shall address to you. If after explanation you can attach any thing like truth to these imputations, you may justly charge me with no inconsiderable degree of assurance in venturing to appear again before you in the character of a teacher. Had the charges been confined within the circle of this Hospital, I might have trusted for a refutation to the report of those by whom my character and qualifications are better known; but unfortunately, my name has been branded throughout the profession as an injury to the school, because certain persons happened to be interested in my exclusion.

Had I obtained from Mr. Abernethy that justice I had a right to demand at his hands, all comment from me here would have been unnecessary; but I am on this, as on a former occasion, left to fight my own battle. For some years the most ungenerous means have been resorted to, to affix a stigma of incompetency on my professional character; and to a professional man, what injury, let me ask, can be sustained more dangerous, than a successful attempt to brand him with a reproach of incompetency?

That Mr. Abernethy has spoken of me in terms of disparagement, no one can doubt; that he has used language, under impressions derived from others, and in moments of irritation, of which he has subsequently on various occasions expressed his regret, but without expecting that it would be registered for publication years afterwards, neither can there be any doubt; that this language has been carefully recorded by the hand of malice for an express purpose, is equally indisputable. The events of last year would probably have never strongly recurred to my mind, except to claim a feeling of pity for them whose hopes had been disappointed, had not the recent publication of this language excited in my own mind, and in that of every professional man with whom I am acquainted, the most unqualified feelings of disapprobation and disgust.

Gentlemen, Mr. Wormald, my co-apprentice, my junior, and my colleague, a candidate with myself for public honours, has made partial statements, has quoted intemperate and passionate expressions as deliberate opinions, has detailed and published conversations, private and confidential, for the honest purpose of blasting the reputation of an electioneering opponent.

In a letter, I might almost say a pamphlet, (detailing the history of his professional life,) which he circulated among the Governors, he has directed the particular attention of his readers to some observations published in a former Number of THE LANCET, with which he provided each governor, to whom he sent his letter, because they were supposed to convey impressions unfavourable to my professional character. (*Disapprobation.*)

After expatiating largely on the important advantages which would accrue to the Hospital by his election—after doing ample justice to the "enthusiastic reception," and entire satisfaction which had attended on his essay here—our author proceeds to say, "he would not risk his reputation by pulling with me?" Risk his reputation—what does this mean, for I cannot understand? Allowing for his sensitive apprehension of his reputation at a former time, he has shown little tenderness for it at the present; and I sincerely hope his recent conduct has relieved him from all anxiety on that head for the future. My opponent has taken on himself to state, that my demonstrations were a failure—is this true, or is it false? My reply to this charge is short:—

In the course of *one hour*, 145 out of 165 gentlemen, attending the demonstrations, signed a letter unsolicited and unknown to me, expressive of their complete satisfaction of the mode in which they had been delivered. Independent of the cordial expressions of approbation which reached me subsequently, from several of those who had previously been hostile to me.

After the election, on observing Mr. Wormald's name again associated with mine, I immediately wrote to Mr. Abernethy to appeal against his re-appointment—stating to him, that "I did not desire to retain the demonstrations alone, but that I would willingly join my exertions to those of any person with whom, consistently with the common feelings of right and wrong, I could allow my private and professional character to be associated." Without the permission of the medical gentlemen of this Hospital, I am not warranted in stating to you their opinions entertained and expressed to me of Mr. Wormald's conduct. It is sufficient for me to say, they were such as fully justified my application.

Mr. Wormald has stated, that "he cannot pull with me;" my dislike to this same "pulling" must be very obvious, nor can I perceive the justice of his expecting from me farther co-operation with him.

Gentlemen, I beg you will fully understand that I am still the aggrieved party, and not the aggressor; the gauntlet has been thrown to me, not by me; and I appeal to those older students now present when I say, that throughout the disputes and contentions of last and this year, I have acted on the defensive only, nor am I aware of having taken any advantage of the exposed machinations of my enemies. If I am asked, why I venture in this public theatre to discuss subjects unfavourable to tranquillity, my answer is plain—It is here, in my character of demonstrator, I have been attacked—it is in the same character I make my defence.

Justice has been refused me elsewhere, and no power on earth should have compelled me to commence another course in this theatre, without availing myself of this opportunity of reply—or to shrink from what I believe to be a duty I owe myself—by tacitly submitting to be degraded from the rank to which I am entitled in this Hospital, and in the profession.

Loud bursts of applause were repeatedly expressed during the delivery of this address.

CLINICAL INSTRUCTION.

To the Editor of THE LANCET.

SIR,—In a very recent Number of THE LANCET, I observe a communication to the Editor on the subject of clinical instruction, pointing out its vast importance to practical medicine and to the public health. The occasion of the letter has been, I think, some public notice relative to a clinical school forming at the Westminster Hospital, and the subscription is — Magrath, Camdentown. With the exception of the sneers at the College of Physicians, or rather at those venerated seats of learning from which the College draws her supplies of talent and erudition, there is nothing in that letter to which I do not entirely subscribe. As it is scarcely possible to overrate the value of professional skill to the sick, so it must be difficult to form too high an estimate of the utility of the most efficient of all means for its attainment, viz. clinical instruction. Your correspondent has accordingly by no means exaggerated its importance in placing it altogether in the foreground, and giving it precedence *longo post intervallo* of all other branches of medical education. In prosecution of the subject started by Mr. Magrath I have some remarks to offer, the insertion of which in your next Number will much oblige

A FRIEND TO THE LANCET.

Welbeck-street, Sept. 24, 1827.

In clinical instruction, as in other things, there are several methods of attaining the same object, different routes to the same end, of which some are better than others. 1st. In some schools the opportunity afforded to the student is that of observation merely, the pupil is but a spectator; the patient and the professor, with their attendants and assistants, medical and menial, are the only performers. In schools on this plan the student observes at his ease and records at his leisure such phenomena as are reported to him, or as catch his own attention—on the causes of those changes he hears, perhaps, after the lapse of several days, a learned discourse, generally rather uninteresting (because more or less unintelligible) to tyros; very often highly interesting and instructive to competent hearers. Such, in a few words, is the plan followed in the clinical schools of Scotland and Ireland. 2d. In other schools pupils have, in addition, the permission to observe morbid phenomena, and to listen daily to able ætiological and therapeutical discourses; the further advantage of being, if not required, at least invited, to take charge of patients as historiographers of disease, and for that purpose to keep accurate notes of the symptoms and treatment. To these notes the professor frequently refers during the visit, or in the course of his lecture; and the liability to such visitation must certainly materially increase the student's assiduity — such are the clinical schools of Paris. Every one acquainted with La Charité and l'Hotel Dieu know that Messrs. Cayol, Recamier, Chomel, &c. were much in the habit of exercising their pupils in the way alluded to. 3d. Other schools go still farther. In addition to presenting to the student's observation the phenomena of disease, and orally explaining to him the grounds of the prescriptions, diagnosis, prognosis, &c.; and in addition to requiring, rather than inviting, him to observe diligently and keep accurate records of cases, there is this further advantage—the pupil is charged with the treatment of diseases, the symptoms of which he must account for, the seat of which he must point out, and the remedies for which he must prescribe. Such is the plan adopted in several schools of Germany and Russia; that for example is the method followed in one of the most recently founded, and most modern in construction of European clinical schools, viz. that of Heidelberg, vide Conradi's *Einrichtung der Klinik zu Heidelberg, &c.*; *Heidelberg*, 1820. A method not very dissimilar prevails at the various public and private obstetrical schools of England, Ireland, Scotland, France, &c. Students of midwifery are allowed to practise to a greater or less extent after having had some instruction. Now the comparative merits of these different plans are not difficult to determine. The business of the student of practical medicine is twofold; he has to ascertain the laws of disease, and to learn the rules of treatment: in the former capacity he is but a spectator; he can but observe and reflect: in the latter he must be an actor, since nothing but practice can confer dexterity. The practical knowledge, or in other words, the dexterity, alluded to, is not an acquaintance with or ready recollection of certain pickled maxims or golden rules of treatment; but it is a familiarity with symptoms, measures, shifts, emergencies, contingencies, contrivances, &c. &c. which is to be acquired only in personal conflict with the difficulties of curative medicine in a course of practice. It is plain, therefore, that the plan followed at Heidelberg is by much more complete, and we may infer, efficient, than that of Edinburgh, or that in principle nearly identical one adopted in Paris. Under the head of what Conradi calls "Auscultanten" fall the whole of the pupils of the Scotch, Irish, and French schools. There is, however, at

Heidelberg a second or senior class called "Practicanten," who are in the enjoyment of advantages unknown to the clinical students of France and Great Britain; those senior or practising pupils are charged with the treatment of the sick under professional superintendence, and are, in fact, junior medical practitioners acting under the direction or inspection of a senior or consulting physician. The "practicant" must visit acute cases at least twice daily, and be within call at all hours of the day and night; he must be in constant communication with the professors, and keep full and accurate reports.—Vide Conradi, Rap. 6. On the whole, I think there can be no doubt that the methods of Edinburgh and Paris are not well calculated to make practitioners: the means employed are not adequate to the effect required. I wish, therefore, through the instrumentality of the widely-circulated pages of THE LANCET to call the attention of London physicians, and particularly of the meritorious institutors of the Westminster Hospital clinical school, to more perfect models than any that the empire of France or Britain afford.

To the objection that Britain is a free land, entertaining sentiments and habits hostile to such undertakings, I reply—That in midwifery the thing is done daily in this country without disguise; that much of the practice of dispensaries in this very capital devolves upon pupils and other undergraduates; that our hospitals likewise present examples in the offices of house-surgeon and apothecary; and that since the practice of undergraduates prescribing is to a greater or less extent already established, and regarded with tolerance if not with partiality, there can be no good objection to conferring by public recognition, respectability and distinct and defined responsibility on practitioners, whose labours are on the whole useful to medical art and to the public health; and who, at all events, cannot or will not be suppressed: the fact is, that under superintendence, as at Heidelberg, nothing but good could result. The "practicant" of Heidelberg is as much the friend as physician of the sick; through him the patient can manifestly communicate every little wish to the authorities and servants, medical and non-medical, with far greater effect than through any subaltern officer; experience would quickly teach patients not merely to tolerate the practicanten but earnestly to desire their attendance.

J. C.

P.S. From a hand-bill of the Physicians of the Westminster Hospital, which I have observed in the shop, I think of Messrs. Callow and Wilson, I have reason to think that something similar to the Heidelberg plan is in contemplation. If those Gentlemen have the courage to introduce so wholesome an innovation as that above recommended, they will deserve and obtain the thanks of every well-wisher to practical medicine and of every public-spirited individual.

SIR A. COOPER'S PORTRAIT—*Where is it?*

To the Editor of THE LANCET.

SIR,—I am happy to find, by a recent Number of your valuable publication, that Paul Pry has made his entré at one of the Borough hospitals; at his next visit, I hope he will "drop in" at Guy's, and make the following inquiries, viz.:—What is become of the sum of money, to the amount of near 700*l.*, subscribed about eleven years ago, by the students, for a portrait of Sir Astley Cooper, Bart.?—Whether Messrs. Key or Stocker were appointed treasurers?—And lastly, To what use the interest, which, by this time, simple and compound, will amount to nearly the original sum, is to be appropriated?

Paul Pry may rely upon it, that his "dropping in" will not be considered an "intrusion" by those gentlemen who subscribed their guineas on that occasion.

I remain, yours, &c.,

A CONSTANT READER.

QUACKS AND REGULARS—IRISH WIT.

IT has been somewhere said, that the only difference between a *quack* and a *regular* is this: that the one kills you, whilst you "*die under*" the other.

A poor Irishman, who was lately admitted under the care of Mr. Travers, seems to have been much of this way of thinking. He was the subject of an eruptive disease; and when questioned by Mr. Travers, as to whether he had "ever been under the care of a quack."—"*Och! no*, (rejoined Pat), *plase your honour—Shure I never went to a* HOSPITAL *before.*"

CASES OF EXTRAVASATION OF URINE.

ST. THOMAS'S HOSPITAL.

CASE 1.—*Extravasation of Urine, from ulceration of the Urethra, with Stricture anterior to the Pubes, followed by Sloughing of the Integuments of the Penis.*

J. DIGBY, ætat. 60, an infirm man, admitted into George's Ward on the evening of the 17th of September, under the care of Mr. Green, with incipient gangrene of the integuments of the penis.

It appeared, from the patient's statement, that he had been affected with stricture of the urethra, and great difficulty in passing his urine for several years; and that, at one period, he underwent an operation in the perineum, in consequence: for several months previously, he had passed his urine only by drops. He said, that he had frequently used bougies—in fact, that he was in the habit of employing them from day to day; and a few days before his admission, he attempted to pass one; and, in doing so, used considerable force—shortly after this, the penis began to swell. When admitted, there was a dark vesicle, of the size of a shilling, on the dorsum of the penis, and it was affected with general œdema, the integuments being of a dark red colour. The treatment of the case devolving on Mr. John South, in the absence of Mr. Green, this gentleman, after considerable difficulty, succeeded in passing a silver catheter into the bladder, and drew off about a quarter of a pint of urine; the instrument was retained by means of tapes. The obstruction to the passage of the catheter, was stated by Mr. South to be especially felt, at about four inches down the urethra, and also in the membranous portion. A poultice of stale-beer-grounds was directed to be applied to the penis.

18. There is now a slough on the dorsum of the penis, of the size of half a crown; the whole of the integuments are œdematous, and greatly swollen; there is much pain extending up the chord on each side, with tenderness on pressure, as also over the pubic region generally. The scrotum is inflamed in appearance, and somewhat swollen; but, on close inspection, there seems to be no indication of urine being extravasated; the perineum is free from tenderness. The catheter is retained in the bladder; poultices continued to the penis, and the bowels have been opened by a mild purgative. There is some constitutional irritation; the tongue dry; pulse about 90, and compressible; he complains of thirst, and his countenance is somewhat anxious.

19. Mr. Green visited the patient to-day, and upon examining the parts, found a blush of inflammation to some extent around the root of the penis, with great tenderness on pressure, and an obscure sense of fluctuation. A free incision was made, and a large quantity of fœtid pus escaped. Mr. Green directed five grains of Dover's powder to be given every six hours, in a dose of saline effervescing mixture; the poultices to be continued.

21. The patient experienced much relief from the evacuation of matter, and there is now a free discharge from the opening. Nearly the whole of the integuments of the upper part of the penis are in a sloughy condition.

23. The pulse flagging. Ordered a scruple of aromatic confection, with five grains of the carbonate of ammonia, and ten minims of laudanum in camphor julep, every four hours. Sago, port wine, and porter, allowed.

26. A large portion of the slough on the dorsum of the penis has separated. Ordered to apply the dilute nitric acid lotion, by means of lint; over this the poultices to be laid.

28. The slough entirely detached, leaving a florid healthy-looking surface; about the upper half of the penis is thus denuded. The lotion and poultices are continued. Mr. Green withdrew the catheter to-day and reintroduced it without much difficulty.

Oct. 7. Nothing material has transpired since the last report; the parts have gone on gradually healing, and the patient improving in health.

11—17. The parts healing fast; the patient's general health good, and he urinates without much difficulty.

GUY'S HOSPITAL.

CASE 2.—*Extravasation of Urine, from Ulceration of the Urethra; with Stricture anterior to the Pubes.—Operation of laying open the Urethra in the Perineum, and fatal termination of the Case.*

THE following highly interesting case of extravasation of urine, occurred during the past week, at Guy's hospital. It will be observed, that although the case, in some respects, resembles the preceding one, inasmuch as urine became extravasated anterior to the pubes in the first instance, from ulceration of the urethra, with stricture at

this part; yet the treatment of the case was rendered much more difficult, from the utter impossibility of passing a catheter; and thus it became necessary, in order to stay the further infiltration of urine, that an opening should be made in the perineum; but this operation was deferred (we had almost said *unfortunately*) until the urine had found its way into the perineum, and the case, as will be seen by the report, terminated fatally, the post mortem examination showing very singular and extensive disease about the prostate.

J. Pugh, a stout middle-aged man, was admitted into Accident Ward, on Friday evening, September 28th, under the care of Mr. B. Cooper. He was sent to the hospital by some neighbouring surgeon, and was stated to be labouring under inguinal hernia; but Mr. Callaway, who visited the man shortly after his admission, arrived at a different conclusion: he found on the right side, near to the root of the penis, a fluctuating tumour, into which he thrust a lancet, and evacuated a considerable quantity of pus. On making inquiry of the patient (who however gave a very unsatisfactory account,) it appeared that the swelling had existed nearly a week; that he had, for several years, been labouring under stricture, and of late had passed his urine in a very diminished stream. The bladder not being distended, and the patient evincing much irritability, Mr. Callaway did not attempt to pass a catheter. He prescribed one grain of calomel, with a grain of opium, to be taken every four hours, and an enema of castor oil; a poultice to be applied to the part incised.

Saturday. We find the patient to-day with a sloughing wound at the root of the penis, on the right side, as large as the tip of the finger, and the skin to some extent around it of a dark red colour. The scrotum is red and swollen, but has no appearance of urine being extravasated in its cellular tissue. The urine is passed with some difficulty: a very firm and insuperable obstruction to the passage of the catheter, is stated by Mr. Callaway to exist a short distance down the urethra, which is also in a highly irritable condition: the bowels are freely open. Calomel and opium continued, and poultices to the wound.

October 1. The wound at the root of the penis has very considerably extended, and the urine partially flows through it; this was observed, in a slight degree, yesterday. *No further measures adopted.*

2. Attempts were made this morning to pass a catheter, by Mr. Callaway, for a considerable length of time, but without success. In the afternoon Mr. Cooper saw the patient, and in vain endeavoured to pass an instrument into the bladder; the obstruction was about two inches and a half down the urethra, and this part being once passed, with a small elastic gum catheter, so that (as Mr. Cooper thought) the instrument could be felt in the perineum, still it was found utterly impossible to carry it further. The ulceration at the side of the penis had now so far extended, that on the occasion of passing a probe down the urethra, another, introduced at the wound, readily struck against it, and the urine passed through very freely; the wound had a foul sloughy appearance, and had much increased in size. Mr. Cooper was of opinion that there was no extravasation of urine in the scrotum or in the perineum; he directed the elastic catheter to be retained, as far as he had been enabled to pass it, anticipating that the urine would flow through the instrument, and thus its passage through the opening on the side of the penis would be prevented. Mr. Cooper also directed that the patient should be put into a warm bath, and the pills of calomel with opium to be continued; nitric acid lotion and poultices to the wound.

3. The catheter was only retained for a short time yesterday; the urine now flows freely through the wound, and the skin around it is much inflamed; the scrotum and also the perineum are tender on pressure, but there is no distinct indication of extravasation of urine; and this is stated to be the reason for not laying open the urethra in perineo, as proposed yesterday. The pulse this morning is low (there has been nothing remarkable in its character hitherto,) the tongue is dry and fissured. Some julep of ammonia prescribed, to be taken every four hours.

4. Much the same; no further means employed, the urine continuing to issue from the wound,

5. It was evident on examining the patient this morning, that extravasation of urine had taken place in the perineum, either by a fresh lesion of the urethra, or from the urine infiltering into the cellular membrane at the ulcer existing at the root of the penis, and passing backwards; the scrotum, however, was not much swollen. — It was now determined upon to perform the operation of laying open the membranous part of the urethra: this was accomplished by Mr. B. Cooper with some difficulty. An incision was made somewhat similar to that practised in lithotomy; but owing to the engorgement of the surrounding cellular tissue with ill-conditioned pus and urine, the parts had become so much altered in appearance, that the passage of the urethra was not readily found. However, at length Mr. C. suc-

ceeded in passing an elastic catheter onwards, apparently into the bladder, and this was retained.

6. The pulse very feeble; tongue dry, covered with a thick fur, and cracked; the wound in the perineum looking sloughy, that at the root of the penis cleaner, and the integuments around less inflamed. The catheter is retained in the perineal opening, and *the urine passes freely through it.* Ordered, five grains of carbonate of ammonia, with half a grain of opium, to be taken every four hours. Wine to be given at intervals.

7. The patient died this morning.

Post Mortem Examination.

The urethra was sound and healthy, to about the extent of two inches and a half downwards, and here a most extensive destruction had taken place, in fact all appearance of urethra was gone, and a large sloughy pouch was formed by the surrounding cellular texture, so that it was impossible to pass a director onwards to the bladder. The urethra was so completely destroyed, that there was no remains of the stricture to be seen; this had given way in the general and extensive ulceration and sloughing which had evidently taken place from the extravasation of urine. Proceeding from the ulcerated portion, the bulbous part of the urethra was found to be healthy; at the posterior part, that is to say, at its junction with the membranous portion, there was an evident preternatural narrowing of the canal, and upon close inspection some thickening beneath the mucous membrane was detected, constituting a stricture; but, as Dr. Hodgkin remarked, by no means "a bad stricture." The incision which had been made through the perineum into the membranous portion of the urethra, and which we suppose was intended to be carried onwards, through the prostate and neck of the bladder as in the operation for lithotomy, was found to have been made obliquely through the under part of the prostate gland, *but had not entered into the bladder, nor had the catheter been introduced from the wound into the bladder.* The fact is explained thus—the ducts of the prostate gland were enormously enlarged, and from the dilatation of these ducts, sacculi were formed in the prostate, containing calcareous matter and urine, and having a free and direct communication with the bladder by means of the mouths of the ducts. The knife, therefore, had cut through a portion of the prostate gland, and opened into the largest sacculus, which was on the left side and underpart of the gland; a gush of urine consequently ensued, and of course led to the belief of the bladder being opened; into this sac, too, the catheter was introduced from the perineum, and the urine readily flowed, in consequence, as we have seen, of the direct communication existing between the pouch and the bladder itself. The point of the knife had evidently gone immediately beneath the mucous membrane of the neck of the bladder, and there was an ecchymosed spot of about the size of sixpence on the inner surface of the bladder, above where the instrument had passed. There was purulent matter in the cellular tissue around the neck of the bladder, its internal surface was sacculated, and puriform fluid issued from the cavities when pressure was made.

ST. THOMAS'S HOSPITAL.

THE only operation performed at this Hospital since our last report was *amputation of the penis*, by Mr. Travers, in consequence of cancerous disease.

ST. THOMAS'S HOSPITAL.

DISTRIBUTION OF PRIZE MEDALS TO THE STUDENTS.

MR. GREEN appears to be resolved to excite a noble spirit of emulation amongst the Students of St. Thomas's Hospital. He has offered a valuable Gold Medal for the best set of Clinical Reports, to be awarded at the termination of the Season; also, a splendid Gold Medal for the best Anatomical Preparations, which may be either retained by the student, or they will be taken by the Museum at a fair valuation, with "honourable mention" of the student's name.

TO CORRESPONDENTS,

A vast number of Communications have reached us, all of which shall receive early attention.